

# Proceed



1997 Air Force  
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## Strategic Management in a Customer-Centered Military: Operationalizing Quality Air Force through Strategic Planning

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*Abstract: Quality Air Force (QAF) has been the most notorious strategy for improving productivity and decreasing costs in the Air Force since 1988. With our military environment changing at an unprecedented rate, many organizations are feeling the painful after-effects of the recent drawdown. As more organizations fail to link QAF to meaningful results, many Air Force leaders are questioning how well QAF has fared in solving problems and adding muscle to mission accomplishment.*

*The wholesale integration of QAF with the fundamental strategies and daily operations of a military organization is the key to solving the problem of QAF's limited success. QAF must be fully affiliated with the strategy and operation of an organization: this affiliation begins with strategic planning. The binding of these exclusive management processes requires the presence of three vital concepts. While these three concepts serve to link QAF with an organization's strategy, the treatment of the two as separate entities has resulted in four distinct problems. This paper not only defines and describes these concepts and problems, it also highlights the benefits derived from having an organizational strategy which drives QAF implementation.*

### Introduction

Cynical comments about Quality Air Force run rampant through every nook and cranny of our organizations: QAF is dead! QAF will never work in the military! Quality Air Force! While every Manpower and Quality Management office in the Air Force continues to lead the charge for operationalizing QAF in our military culture, the lingering doubt that something is askew still looms large.

Quality Air Force has been the most notorious strategy for improving productivity and decreasing costs in the Air Force since then-Secretary of Defense, Frank Carlucci, mandated Total Quality Management implementation in 1988. With our military environment changing at an unprecedented rate, many organizations are feeling the painful after-effects of the recent drawdown: organizations are spending vast sums of money on QAF training, yet are still feeling their mission capability wane. As more organizations fail to link QAF to meaningful results, it is understandable why many Air Force leaders are questioning how well QAF has fared in solving problems and adding to mission accomplishment.

Quantitative research on QAF, and its degree of effectiveness in the Air Force, is rare; but, recent studies on the corporate community have begun to assess the true implications of Quality Management implementation. Evidence from the following studies indicates some organizations have seen considerable improvement from their implementation efforts, while others have seen little or no change. The US General Accounting Office study of 20 organizations that have received high Malcolm Baldrige National Quality Award scores shows the most positive results—over 80% of the respondents indicated their measures to improve quality had been successful (Mendelowitz 36). On the contrary, a more definitive survey conducted by the Conference Board shows that less than one-third of the respondents are seeing substantial improvement in operating results (Hiam 90). To support the Conference Board's claim, Wellins et al suggest that overall success is affected by how the organization's philosophy on Quality Management is implemented (17). The well-documented anecdotal evidence of both the success and failure of Quality Management implementation efforts in these companies strongly suggests the current implementation model needs to be refocused to reduce this rift.

The wholesale integration of QAF with the fundamental strategies and daily operations of a military organization is the key to solving the problem of QAF's limited success. QAF is too often treated as a separate aspiration. In reality, QAF must be fully affiliated with the strategy and operation of an organization: this affiliation begins with strategic planning. The synergy between strategic planning and QAF will strengthen each other, and each will enable the other to achieve success in today's military environment. QAF alone cannot guarantee success, but QAF coupled with strategic planning offers the best hope.

Many argue that QAF is already integrated with the organization's strategic planning because many strategic plans include quality goals, most senior management teams drive current quality efforts, and most process action teams are chartered based on their importance in meeting mission requirements. While all of this is true, it doesn't go far enough; strategic planning and QAF must be coupled to provide a unified thrust. The binding of these exclusive management processes requires the presence of three vital concepts.

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### Strategy must be Customer-Driven

The first concept is that the strategic plan must be customer driven. Although most Air Force organizations consider their Design of Operational Capability, or DOC statement, when developing their strategic plan, few plans are truly driven by the needs of those who use their outputs. In a survey of 14 leading companies, including three Baldrige Award winners, all indicated that they have formal strategic planning processes (Webb 19). Of these companies, however, only one cited the customer as currently being the primary driver for their strategic planning efforts (19).

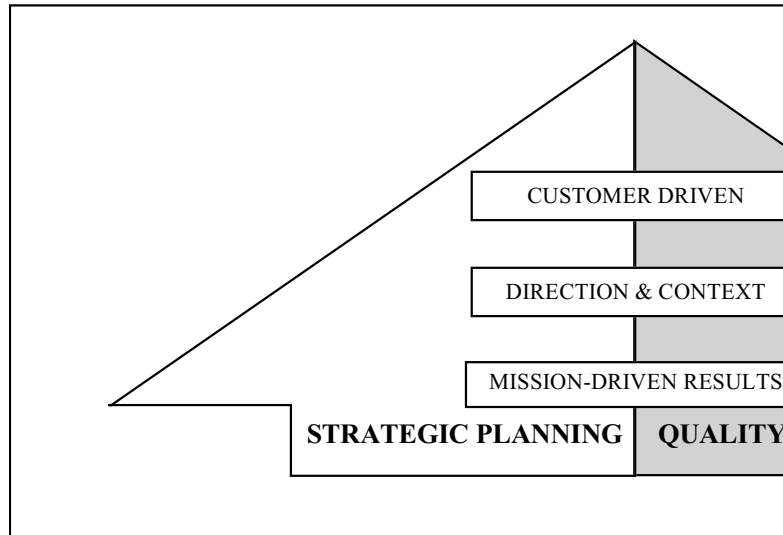


Figure 1: For Strategic Planning and QAF to drive improvement, three concepts must be shared.

The fact is in this highly volatile military environment, the overall success of an Air Force unit is ensured only when it can continuously provide the best value to those it serves: its key customers.

After establishing a strategy that resounds what is valuable to an organization's customers, building performance measurements which reflect this value will ensure that adequate performance can be attained. This is fundamentally different from setting arbitrary numerical goals and then looking to see whether congressional or higher headquarters budgetary constraints will support the numbers.

### Strategy must give Direction and Context

The QAF philosophy establishes a foundation for enabling trust, teamwork, and continuous improvement—the QAF Credo. In order for this credo to be realized, QAF must be driven by the organization's strategy. The second concept requires strategic planning to provide the proper direction and context for QAF. For this to be effective, strategic planning must also precede other QAF initiatives, such as chartering Process Action Teams, building process measurements, and flowcharting key processes. This particular concept, however, is often the weakest link in the chain. Goodstein, Nolan and Pfeiffer, authors of *Applied Strategic Planning*, stated their collective experience as change agents and management consultants has convinced them that companies' strategic plans rarely affect daily decision making (358).

### Strategy must be focused on Results

The third concept requires the culture which supports QAF, as well as the efforts which facilitate continuous improvement, be focused on achieving results. Differing from typical managerial approaches, results that increase value to customers and ensure long-term capability to meet future mission requirements should be pursued. In many organizations, however, improvement efforts focus on activities rather than on results. Schaffer and Thomson called these false efforts "activity-centered" programs: systematic practices that seemingly confuse ends with means (80). Organizations that subscribe to activity-centered programs assume that performing enough of the right activities will eventually improve performance. Activity-centered programs, however, focus on such activities as hours spent in training and the number of suggestions made rather than on results such as process capability and customer satisfaction.

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Given the vast number of units within the Air Force that build their strategic plans around internally-focused metrics, maintain separate implementation structures for strategic planning and QAF, and use activity-based measures for determining the success or failure of QAF, one thing is certain: dissatisfaction with the expected improvement from QAF is not surprising.

## PROBLEMS INTEGRATING QAF WITH STRATEGIC PLANNING

Formal strategic planning has been conducted in corporate America for more than 30 years (Goodstein 3); yet, the concept of strategy is not unfamiliar to the military. Still, strategic planning as a formalized process evolved in America during a period when consumer markets and production technology were highly predictable (Drucker 3). Early efforts to formulate strategy became more sophisticated over the years to offset seemingly exponential change. Corporate strategy also became dependent on intuition and past performance to guide future goals and objectives. Plans relying on these perspectives became increasingly unreliable because of the unpredictability and complexity of the current environment (Trotter 6).

In the Air Force, emphasis on such misguided performance measures as aircraft take-off rates forces the strategic planning process to miss its ability to improve customer value. Participation in the planning process is also limited, and the output is often restricted in its distribution.

QAF has very different characteristics—it does not have the strong academic roots of strategic planning. Due largely to cost cutting pressures from congress, QAF was conceived to respond to ever-changing mission requirements, and refocus the Air Force's core competencies towards that which would be valuable to those serviced by the military. QAF activities are communicated with vigor, by involving many employees and establishing baselines for continuous improvement. Because of these separate developmental patterns, full integration of strategy and quality has been very slow.

### Counting Activities

This dichotomy results in four distinct problems. First, without being fully integrated with strategy, efforts to build a QAF culture can lead to an activity-centered approach. The process focus of QAF allows for the easy placement of measurements of activity vis-a-vis process capability. For instance, an organization may inadvertently focus on things like the number of teams they have chartered instead of things like the degree of customer satisfaction.

Linking strategic goals and objectives to continuous improvement initiatives is not enough. Non-strategic projects can continue to displace the strategic improvements that are needed to achieve rapid progress. Adding measures that focus on results to the organization's myriad of process measurements misses the point; it is not the *addition* of measurements that eliminates the activity-centered myopia, but the *integration* of QAF with the strategy.

### Ambiguity

Second, the separate nature of strategy and quality, even when quality is part of the strategic plan, can result in significant ambiguity within the organization. In part, this is due to one of three possibilities: tension that exists between the functional goals and the "quality" goals (and tension between satisfying the customer and satisfying higher headquarters); differences between the level of employee involvement in the strategic planning process and the quality process and; the level of management attention given to strategy and quality.

Today, the performance of many Air Force Leaders continues to be measured by functional targets. Managers at all levels are left with the challenge of having to match customer demands with operating budgets; yet, they continue to be evaluated largely by how well they meet internally-focused goals and objectives. This can lead to sub-optimization, with managers meeting functional goals first and giving the customer what is left. Faced with confusing or conflicting goals and having incomplete communications relating to strategy development, managers exhibit a certain degree of timidity in carrying out the strategy.

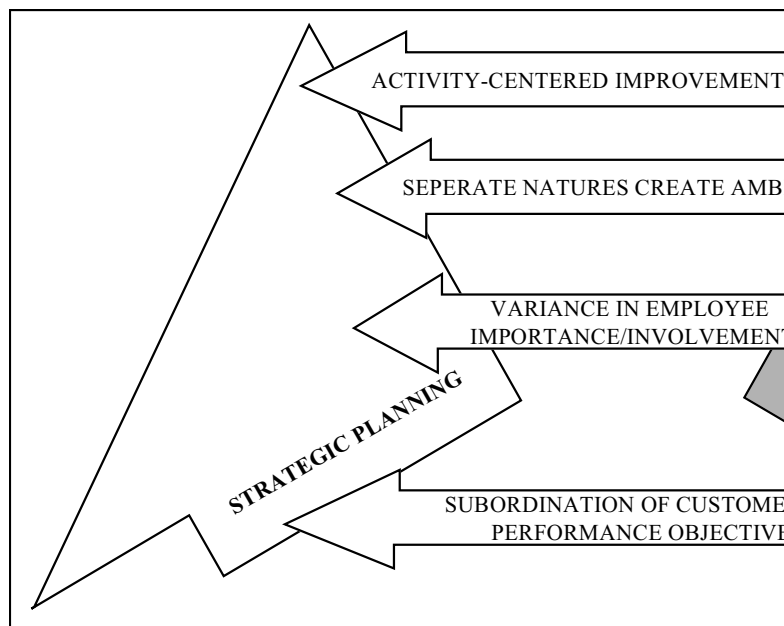


Figure 2: Four Common Problems Associated with Integrating QAF and Strategic Planning

### Variation in Employee Worth

Third, nearly all organizations proclaim that employees are their most valuable asset, yet many behave quite differently. The people who could contribute to determining customer value and who know about the organization's capabilities and weaknesses are often excluded from the strategic planning process.

In large organizations that have a formalized strategic planning process, it is common to see strategic planning to be assigned to a Tiger Team, an aggressive Company Grade Officer, or the Manpower and Quality Office. Due to the sensitivity of the material, the resulting document is usually restricted in distribution. In some organizations, middle managers never even see the strategic plan.

Excluding employees from the strategic planning process makes it extremely difficult for them to relate their jobs to the strategic goals of the company. Even worse, because many organizations do not even communicate the plan when completed, there is no chance of gaining the level of support necessary for successful implementation.

### Rift Between Customers and Objectives

Finally, The classic model for strategic planning begins with performance objectives, then examines customers, stakeholders, and the environment to find ways to achieve the numbers (Goodstein 58). This inside-out approach has two faults: it is based largely on projections of current activities and assumes that the organization, not the customers, can determine the organization's success.

Rethinking the strategic planning model based on the principles of QAF will result in a new model that is substantially better at dealing with turbulent times. Integrating QAF into the strategic planning process requires an increased emphasis on defining and delivering best customer value. Process capability relevant to customer value, not output, should be the driver for strategic planning. Carothers and Adams, authors of *Competing Globally Through Customer Value*, believe that determining customer value is the primary task of managers (121). This does not mean output is less important to the success of the organization: without adequate delivery of the mission requirements within a predetermined budget of money and manpower, the organization will fail. Effective and efficient delivery of the mission should be the outcome, not the driver, for strategic planning. Output becomes the result of a winning strategy.

Determining customer value differs fundamentally from identifying opportunities or determining customer satisfaction. It requires an understanding of what the customer values and how the customer assesses your success. This goes far beyond merely identifying needs. The real strategic opportunities lie in areas in which customers do not currently know they have needs.



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Applying QAF's emphasis on employee involvement in strategic planning will not only result in better planning but also in better execution, which is frequently demphasized in the strategic planning process. Many managers, while admitting the advantages of broader input and wing-wide communication, remain concerned with the proprietary nature of strategic plans.

Obviously, there needs to be a balance. Major mission changes or new processes which support sensitive Air Force assets, for example, must be closely guarded. On the other hand, mission-sensitive information can be generalized for wider distribution. Far too often, managers err in the direction of over-controlling this information. A vice president of a major electronics manufacturer posts the company's most sensitive financial information in its main hallway (George 88). He is not concerned that competitors will see his secrets and believes that letting his employees know what is going on in the company is the best way to stay ahead. Would this be too much of a stretch for an organization in a military setting? Perhaps; but, just how relevant is much of the information we consider "sensitive" to an airman trying to find purpose in their organization? Each employee should be able to describe the strategy as clearly as the senior managers and be able to explain how his or her job contributes to implementing that strategy. Without such strong alignment, the vast energy of the organization's most important asset is wasted.

QAF adds process orientation to strategic planning, which is a switch from the traditional functional approach. Rather than looking at the contribution of each function to the overall strategy, Air Force organizations should identify strategic processes that provide customer value and that link to specific mission requirements. Because these processes cross traditional functional boundaries, ownership for each "system" must be established to standardize and lead these strategic processes. A cohesive strategy is best carried out with the systems approach in mind, not through the traditional functional hierarchies.

Fully integrating QAF with strategic planning provides the direction, justification, and context for a successful shift in organizational culture. The skepticism currently aimed at QAF misses the point. If an Air Force unit begins their QAF "journey" with the assumption that QAF is an activity that prompts an immediate expectation of a return once resources are invested, it will inevitably end up seeing QAF as "just another management fad." QAF is a philosophy. It is not something an organization does: it is the way an organization does everything. Many implementation models define a quality management approach as an integrated philosophy and then prescribe a program that is not linked to the strategic direction of the organization (McGinnis 49). As Schaffer and Thomson point out, without this integration, the cynics are right—the results will not be there (80).

When fully integrated, the strategic planning process provides direction for the organization's improvement efforts. Not only are the key cross-functional systems identified, but the necessary degree of improvement is clear. There is a significant difference in approaching a system improvement of 20% and a system change in which, in order to align to specific mission requirements, a tenfold increase is needed.

Integration also eliminates wasting limited resources on those processes not directly related to the strategic plan. While brainstorming and employee suggestions are valuable, they can lead to improvement projects that drain resources from more critical areas.

While priority is one dimension sought after in planning improvement efforts, urgency (how soon the improvement is needed) is another. Arbitrary milestones and inarticulate targets are often applied to even the most critical systems because there is no clear-cut basis for defining urgency. Reengineering, which emphasizes the need for bold, strategic moves, sets arbitrary timetables (e.g. 12 months) for critical systems (Hammer 212). QAF's integration with strategic planning will define the urgency by comparing process capability with mission requirements relative to other processes—gap analysis. This strategic endeavor will increase the probability that process improvement occurs when it is needed.

QAF models stress goals and measures. Often, organizations add quality goals to the operational goals of the strategic plan, but they don't question how well these goals work together or whether they are aligned. When aligned with that which is seen as valuable to the customer, goals can form a balanced set of performance measurements throughout the organization.

Changing the culture of the organization is an essential part of any QAF effort, and this must be the priority of the leader. Much has been written about organizational culture and the difficulty of changing it. Coupling cultural change with strategic planning does not make changing the culture easy, only possible. Full integration provides a basis for employees to understand where the organization is going and how the new culture relates to the new direction. It allows employees to see what is in it for them, without being blindsided by the "trust me" approach.

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## Conclusion

When an organization chooses improvements that employees know are not strategic, recognizes people for quality activities that don't yield hard results, and has celebrations based on the number of employee suggestions, employees get the message that QAF is a fad. Building a culture which supports the tenants of QAF is vital, but it must be part of a general strategy that makes sense to employees so they can support it. Without this connection, the leader's job in supporting a culture of trust, teamwork and pride is impossible.

Management today is challenged as never before. Change is everywhere and the future will bring more change. Customers, commanders, employees and stakeholders demand results. The watchful eye of the American people constantly scrutinizes our ability to protect American interests with less of their money. The answer for a unit within the Air Force is not simply another program but the total integration of the tools of strategic planning and the philosophy of QAF. Proper integration of the two will provide a vision of the future that will surmount the turbulence and align each organization, its systems, and its people to provide ever-increasing customer value in each mission.

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## Multiple Scenario Analysis: Essential Steps to Building an Effective Vision

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*Abstract: One common misconception shared by many Air Force senior leaders regarding strategy formation is the importance of “visioning” in a unit’s long-term strategy. Visioning gives an organization the guidepost it needs for unilateral focus. An accurate visioning process also governs the creation of realistic long-term goals. To create an effective vision, an organization’s senior leaders must be able to forecast realistic probabilities of what the future holds: new threats, new technologies, new mission requirements. Of the many forecasting approaches, Multiple Scenario Analysis is the one approach which gives leaders the backbone their vision needs to drive true continuous improvement. This paper touts the many benefits Multiple Scenario Analysis has over its more quantitative forecasting counterparts. This paper also articulates the essential steps any Air Force unit seeking to make their vision statement more an effective, motivational focal point and less an arbitrary “hallucination.”*

### Introduction

Throughout history, humans have dreamt of having the ability to peer into the future. Men and women have wished they could predict with astute certainty the future consequences or outcomes of their present actions. This genuine desire has led men in such diverse fields as economics, finance, insurance, the military, and so on, to devise quantitative mathematical forecasting systems which seemingly predict the future. Hence, many senior executives engaged in long-range planning pledge blind allegiance to such forecasting tactics as linear trend equations, multiple regression and cross-impact analysis. These highly complex methods hoodwink many executive planners into believing their forecasting tools simplified that which was difficult and quantified that which was ambiguous.

But, the verdict is in on these managerial crystal balls. Numerous comparative studies on analytical forecasting styles prove there to be no more advantage or accuracy in their use over the more simpler, judgmental ones (Schnaars 105). Adding to the criticism is the understanding that most conventional forecasting techniques are based on only one conceivable path into the future. This forecast is mathematically derived many times using past information. Essentially, these systems are founded on the assumptions that the future will be a logical extension of the past (105)!

In order to thrive in a volatile military climate, commanders still must seek out various ways to envision the future global environment and derive strategies to meet the future head on. Multiple Scenario Analysis (MSA) gives commanders the ability to formulate strategy around a multitude of conceivable outlooks of the future. MSA can be a dynamic tool for any senior leadership body involved in crafting an effective vision for their strategic plan. Commanders, and their team of planners, must understand how this process is accomplished as well as become comfortable with the essential steps to creating multiple future scenarios. Planners should also see what benefits and concerns MSA brings to the table for an organization. If it is pursued correctly as a supplement to an Air Force wing’s long-term strategy, MSA can provide the right scope and perspective to anticipate probable contingencies and plan to meet future mission requirements with proactive vigor.

### Definition

Multiple Scenario Analysis is a relatively new forecasting technique: it was conceived in the 1950’s when Herman Kahn consulted the Rand Corporation through its strategic planning efforts (Schnaars 105). Kahn defined a “scenario,” the narrative output of multiple scenario analysis, as being “a hypothetical sequence of events constructed for the purpose of focusing attention on casual processes and decision points” (Heydinger 52). Kahn and the hundreds of organizations that utilized MSA in their planning endeavors understood the need for an analytical forecasting tool which did not attempt to provide a precise single-track outlay of the future. With MSA, planners and decision makers were given a series of plausible future environments which affected strategic thinking (Schnaars 106). Analysis of the derived future scenarios was based on the premise that the future was not a mathematical extension of past events and trends, but the result of many mutually exclusive external forces.

Unlike many mathematical forecasting tools—which paint the future landscape through charts, graphs and data tables—scenario analysis is often presented in narrative form. An organization’s planners would enter the plausible future environment much in the same cognitive manner as he or she would enter a short story or magazine article (Morrison 21).

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## Benefits

Using Multiple Scenario Analysis does not excuse one from using past data and present research to predict future outcomes. In fact, the best scenarios (those being the most plausible and understandable extensions of the present environment, however off-cue or extreme they may be) are those which combine refined knowledge of the past, astute analysis of the present and expert judgment of the future (21).

Pinpoint accuracy is not the objective of MSA, as is many contemporary forecasting techniques. As J. Ian Morrison, president of the Institute for the Future, states, the overall objective of scenario development and analysis as a prelude to corporate planning is “not three-decimal place precision but the right direction and magnitude” (21).

Air Force units who involve themselves in analyzing multiple scenarios of their future find this forecasting activity to be most beneficial. One benefit seen in MSA is the unique and risk-adverse structure it provides in strategic planning. Strategic planning, if done correctly, establishes a fundamental template for future decisions for an entire organization. This template, if it is to be seen as a legitimate tool for focus and guidance, should be based on more than just visible current trends or past performance: an extension of past data points on a run chart, for instance. Planners can test their strategic decisions against plausible environments many times before changes truly occur. Crisis management is notorious for forging mediocre decisions from companies. As profound changes envelop the military, those units that were unable to foresee the impact caused by these new environments will most assuredly head to the back of the proverbial pack. The time and expense paid to a scenario-building activity will pay huge dividends to those organizations who use plausible predictions of future conditions to test their current strategies and to guide their future plans.

Another benefit derived through MSA is its ability to force planners to accept and deal with the uncertainty lurking about in the future of air and space warfare (Heydinger 52). MSA forces planners to make founded assumptions about their future environment (Schnaars 107), and accept the fact that they do not have the ability to predict the future. Attention to these underlying assumptions vis-à-vis the organization's cross-functional processes can add validity to strategic planning and increase its probability for success (107). A recent study highlighted this point: the major reason corporate forecasts (therefore strategic plans) turned out to be “lame ducks” was due to the fact that these plans were derived from mistaken underlying assumptions (107).

Many of these failed plans were most assuredly based on merely one assumption about what the future holds, something from which MSA steers planners away. MSA forces organizations to “think on the fringes of one's paradigm.” Without this perspective, commanders may be so involved with perfecting the current processes, products or services that they miss upcoming shifts in the unit's mission or customer base. An organization may be forced to react in order to stay with the pack of competitors. With MSA, Air Force units have an opportunity to shift with the industry instead of being shifted by it. MSA also affords planners the luxury of dealing with ranges of trends and events instead of minute sequences (Heydinger 52). As mentioned before, the objective of MSA is direction and magnitude not pinpoint accuracy.

Finally, MSA adds validity to many outputs of the strategic planning process, such as core values, vision statement, long-term goals, and so on. An organization armed with plausible scenarios of their future environment can ensure their plans and strategies are ones that further define the corporate culture, regardless of what the future holds. For instance, an organization who, through the strategic planning process identified one of their organizational values as meaning “our employees are important to us.” A scenario developed using MSA depicts an economic recession affecting their industry. Obviously, a strategy which plans to reduce payroll during the recession by laying off people will conflict with the stated values—the organization can seek other alternatives and build suitable strategies which reflect their core values.

## Essential steps

Just as there are numerous environmental possibilities for Air Force organizations attempting to peer into the future, so are there approaches to conducting Multiple Scenario Analysis. Schnaars identified seven scenario-generating procedures in an article published in 1986 (115): MSA has become more and more prevalent in corporate America due to the continued failure of pure analytical approaches (Mintzberg 234). Of all the scenario development approaches used in MSA, the following sequence of steps capture the essence of proper MSA philosophy. Any Air Force organization seeking to put some backbone into their strategic planning process, namely their vision statement, should consider using this scenario development approach, as seen in Figure 1.

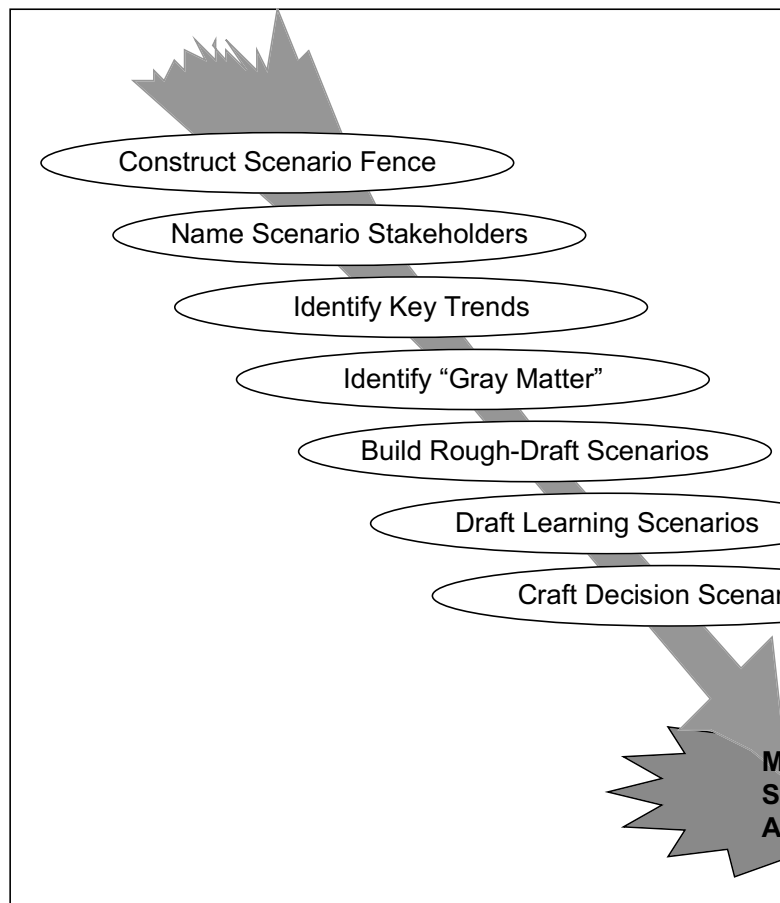


Figure 1: Seven Essential Steps to Building Multiple Future Scenarios

### **Construct Scenario Fence**

The toughest chore for strategic planners in designing future scenarios will be in whittling the large number of possible future outcomes down to a handful of conceivable scenarios. The first of these essential steps will bring planners closer to accomplishing that task by allowing them to define the borders around which the scenarios will “roam.” Planners will determine the time frame which the scenario will describe, as well as acknowledge the environmental variables which will guide and differentiate each scenario (Schnaars 109). Now would also be a good time to consider the format of delivery which the scenarios will take: narrative or tabular (Heydinger 64).

### **Name Scenario Stakeholders**

Schoemaker considers identification of key corporate stakeholders as important once the scenario pre-work is finished (28): hence, it becomes the next step in this MSA approach. Planners must go beyond a mere list of influential entities: they must discover how and why their power levels and influences have changed over the years (28). A good source for much of this information (if the organization were engaging in MSA as part of their strategic planning process) could be the environmental scan (Heydinger 54).

### **Identify Key Trends**

Once stakeholders are analyzed, basic environmental trends which directly and indirectly relate to the organization must be noted (Schoemaker 28). These trends are analyzed against the variables noted in the first step. Known future events, such as a recently-passed government regulation which will go in effect on a known future date, should also be analyzed as well (Heydinger 54).

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## Identify “Gray Matter”

Scenarios not only incorporate known future trends and events but also involve improbable yet important future issues. For that reason, the identification and analysis of key uncertainties is paramount in developing scenarios. Each key uncertainty carries with it numerous outcomes that can affect an organization’s plans in different ways. Each outcome should be determined and the relationship between the outcomes and the variables annotated in the first step should be unveiled (Schoemaker 28).

## Build Rough-Draft Scenarios

The concept of multiple forecasts is seen by many researchers as the cornerstone of MSA (Schnaars 107). As such, the initial scenario themes constructed in the next step will dictate the various credible forecasts used in MSA. Heydinger’s concept of “premise setting” mates well with this step, largely because the setting of each variable’s premise will determine the direction each scenario will take (61). Essentially, a premise defines the conduct of a particular variable in a particular scenario. For instance, if “military presence in the Balkans” was selected as a key variable in the first step, the premises drawn from it may include the following: direct military confrontation; passive peacekeeping with direct political influence or; passive humanitarian support. Only one angle will be represented in any one scenario. This angle will be clustered with other premises as well as the other information established in the first step to form the framework of all the scenarios.

The rough-draft scenarios cannot become the output of MSA until they are checked for consistency and plausibility. Inconsistencies must be acknowledged and aberrations must be remedied before proceeding further. Schoemaker suggests three tests which can ensure consistency. “First, are the trends compatible within the chosen time frame?... Second, do the scenarios combine outcomes of uncertainties that indeed go together?... Third, are the major stakeholders placed in positions they do not like and can change?” (29) These three tests should weed out any obvious gaps. Statistical data must also be generated to support the plausibility of the derived scenarios, as well (Heydinger 66).

## Draft Learning Scenarios

Taking the initial scenario themes generated earlier through the consistency gauntlet will cause the emergence of general themes. These general themes will be tagged to important outcomes and trends in the second rough-draft appropriately called the “learning scenarios” (Schoemaker 29). These scenarios are so called because they will only prompt further research and study rather than provide a catalyst for decision-making.

The research spawned by the learning scenarios is what takes planners to the fringes of their industry’s paradigms: by gaining an astute understanding of how an uncertainty or trend may play out will draw planners to new technologies not yet seen or considered in their “industry.” This step is excellent in promoting the need to integrate certain analytical or “hard” forecasting methods such as cross-impact analysis, with the more intuitive methods (Heydinger 62).

By now, planners are ready to reassess the consistencies built in the learning scenarios and determine whether some mutually related interactions could be better represented as part of a quantitative model (Schoemaker 29). These interactions form convincing balances as well as ensure planners focus solely on the most probable forecasts.

## Craft Decision Scenarios

Finally, after a momentous amount of man-hours, research, and creative energy, planners are finally able to evolve their efforts into the output of scenario development and the heart of Multiple Scenario Analysis: the decision scenarios. These creative narratives will constitute the company’s plausible range of forecasts against which their strategies and plans will be held.

## Conclusion

Multiple Scenario Analysis is not a panacea, no matter how positive its virtues were presented. This truth is, the future of the United States military contains too many variables, probable outcomes and unknowable tangents to be predicted with any degree of certainty. Yet, with a sensible awareness of current internal and external environmental trends, coupled with a significant understanding of plausible shifts and outcomes in military doctrine, a tool such as Multiple Scenario Analysis can transform a proactive Air Force organization into a vivacious leader within its area of responsibility.

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# A Victim of Discontinuous Change: Intended Strategies that Bow to Emergent Strategies

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*Abstract: Many Air Force organizations spend countless man-hours molding and refining, in excruciating detail, what they believe to be the most appropriate strategic direction. This direction, the organization's senior leaders hope, will drive continuous improvement of their processes, heighten effectiveness in their mission, and create value for their key stakeholders. However, the military is in the swift currents of change: innovations and threats shift and evolve quicker than an organization can create strategy. Hence, the fallacy of strategic planning, as it is seen today, makes it impossible to truly wield it as an effective tool for organizational focus and identity. This paper addresses the difference between "intended" and "emergent" strategy, and identifies the need to merge the two approaches to make strategy formation worthwhile.*

## Introduction

Strategic planning can be either the most dynamic strategic tool for organizational change and innovation or the largest "paper tiger" a unit will ever see. To state the act of planning is committed by every human being on earth would be similar to stating the act of running would cause one to eventually gasp for air: planning is a simple fact of life. Each person makes some attempt to conceptualize how one wishes to reach some end target or goal. These plans can be as simple as what dinner will look like to as complex as how one will complete a Masters Degree program. It is this inherent thought process that represents Henry Mintzberg's concept of intended strategy: a plan which guides future behavior and decisions towards a desired end state (Crafting 79). On many occasions, Air Force organizations attempt to formulate strategy based on their present intentions—by simply working out the future scheme of events as they see them. Unfortunately, what one plans is not exactly what one gets.

## Intended Strategy

One reason this occurs is because organizations, when formulating intended strategy, consistently separate "thought" from "action" (82). Unless one is an astounding forecaster of events, one cannot foresee every future contingency or every environmental bump in the road which may wreak havoc on the strategy. Sometimes, to compensate for unforeseen future occurrences, strategists add bureaucracy and control mechanisms to their plan. In their minds, this act ensures any future obstacles will not derail the current intentions of the unit's strategic direction. But we know better.

Despite the frailties of intended strategy, organizations continue to emphasize the importance of "sticking to the plan." Over the years, many strategic planning models have honed and refined the accuracy of strategy formulation under the belief that those who use the new models will gain flexibility. The whole idea behind changing the approach to strategy formulation is to increase the likelihood of realizing the organization's intended strategies. Intended strategies that were fully realized over a stated course of time can be called "deliberate strategies" because they are the successful fruition of one's original plan (Rise 24). Every strategic planning model in operation today, including the Air Force's majestic 11-step model, recognizes the belief that, through sincere effort in following the steps to their model, an organization's intended strategy can be realized. In fact, one planning system claims an organization, through genuine commitment to their applied strategic planning process, can invent an organization's own future through a technique called "proactive futuring" (Nolan 76).

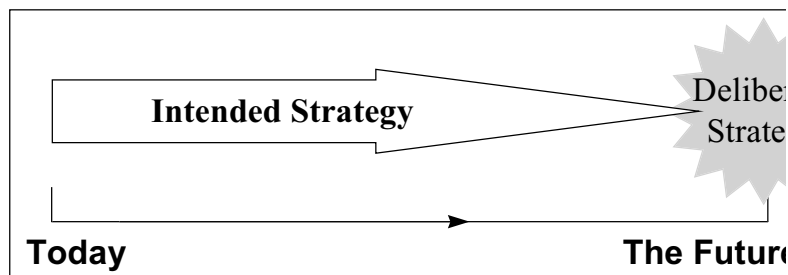


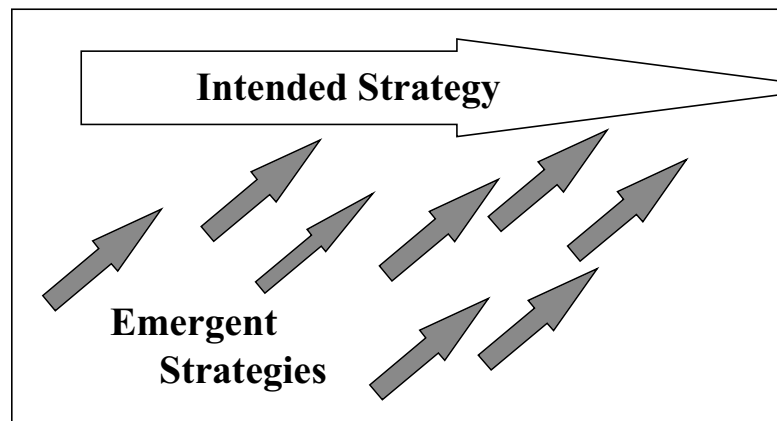
Figure 1: Sticking to the Plan: Intended Strategy



While this may all look good on paper, pressing on with an intended strategy, especially in the face of constant change, may be more dangerous than having no strategy at all. Intended strategy implies two things: first, it suggests an organization's body of senior leaders have such brilliant foresight that they can capture all future customer requirements and; second, it insinuates organizational systems learning does not occur once strategy is formulated (Crafting 82). In an environment where innovation is rampant, committing to an inflexible strategy may spell tragedy for an organization.

### **Emergent Strategy**

There is another way an organization can accommodate change—through emergent strategy. An emergent strategy is one which, over time, is piecemealed to become the realized strategy (Rise 25). Small individual deviations to current processes slowly form patterns which change the overall approach to meeting a need or accomplishing work. Each subsequent change converges with the other changes to build the realized strategy.



*Figure 2: Emergent Strategies Sometimes Rub Against Intended Strategy*

Emergent strategy seems to be more of an evolutionary process than a structured system of events. In most cases, emergent strategy deals with the internal patterns that organizations realize without clear intentions (Crafting 82). A good example of this is the patterns which guided Proctor and Gamble to develop the disposable diaper (Nolan 76). With no clear intentions to develop and eventually redefine an entire industry, Proctor and Gamble had the flexibility within its organization to hone in on an unfulfilled customer need and build a strategy to meet the need (76). Emergent strategy offers the flexibility to apportion resources to seek new markets; unfortunately, it comes at the expense of order and control.

### **Dangers to Planning**

It is important, once one becomes familiar with the two extremities which encompass strategy formulation, to realize certain inherent dangers associated with the act of strategic planning. One danger imposed by strategic planning is its ability to eliminate flexibility from one's unit. If one hopes to achieve deliberate strategy, the ability to align with unexpected changes in command requirements at a "turn of a dime," for instance, is seriously depleted (Crafting 82). The most strategic bit of information an organization can possess may come from one employee, deep within the bowels of a cross-functional process, who discovers a customer with an unmet need (82). This information is no good if an organization has made it inconceivable to break from their intended strategy to respond to the need.

Another danger is the desire to build strategy in clearly specific or intricate terms. An organization whose strategic plan reads like an 800-page government procurement regulation, with detailed plans on implementing long-term change, has also pummeled flexibility out of the picture. While this type of plan may be acceptable in those military environments that do not have a high propensity for change, specific strategic plans take away a decision maker's ability to adapt and exploit other undiscovered realms. A plan of this nature can also shackle everyone else in the organization, since opportunity for emergent strategy can creep up anywhere.

### **Conclusion**

While it may appear strategic planning is a dead-end street, this is not the case. When comparing emergent strategy with intended strategy, one essential truth stands out: both styles of strategy are on opposite extremes of a planning

continuum. Where pure intended strategy impedes organizational systems learning, pure emergent strategy impedes organizational focus and control. Optimally, a unit's senior leadership body would like to have the best of both worlds—to incorporate the maximum amounts of learning and control to their strategy. This means an organization wishing to pursue an effective strategic plan must allow emergent strategy to thrive within their intended strategy (see Figure 3). To do this, an organization's senior leaders should develop broad outlines for the entire organization, then allow the details of each cross-functional system to emerge from within the general plan.

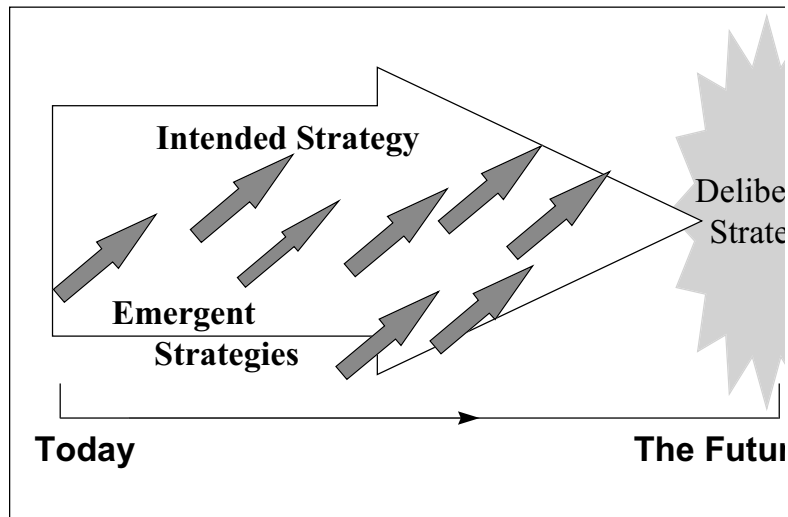


Figure 3: Emergent Strategy Must Thrive Within Intended Strategy

In other words, an Air Force wing would create general conceptual guidance covering long-term tracks (intended strategy), while each group would focus creative energies towards their future mission requirements (emergent strategy). These creative energies would be allowed to flow free within the confines of the overall strategy.

All things considered, an astute strategic planning approach must combine the control elements of intended strategy with the learning abilities of the emergent strategy (25). The relative degree of influence intended strategy plays over emergent strategy should depend on the degree of stability existent in the organization's environment.

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### Master Sgt. Kristofer J. Carlson

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# Restructuring Aircraft Maintenance

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**MSgt Kristofer J. Carlson**

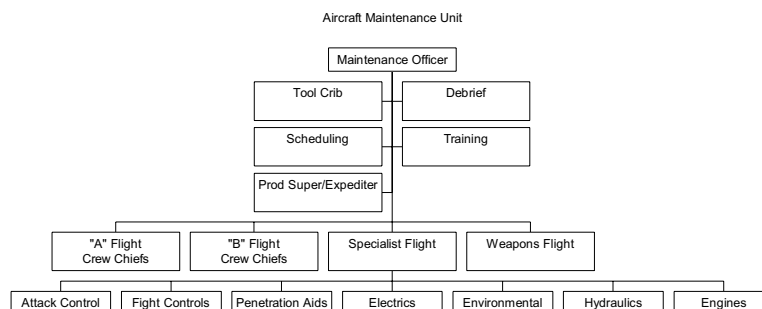
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*Abstract: The aircraft maintenance side of the Operations Squadron is hampered by three structural inefficiencies: too many layers of management, a management structure which divides authority into production and administration, (in violation of Air Force Instruction (AFI) 38-101,) and functionally divided maintenance sections which prevent a true mission focus. I propose to eliminate excess management positions; create a clear, unambiguous chain of command, and enhance the mission focus by combining maintenance sections into new maintenance teams. This will reduce personnel levels, increase efficiency, and create a true mission focus.*

## Introduction

At one time the aircraft maintenance function was organized much differently than it is today. Aircraft maintainers were organized by functional specialty into four large maintenance squadrons. Each squadron was responsible for only part of the aircraft maintenance operation. No one owned the process; each squadron was concerned only for their own prerogatives. Large management structures were developed to control and coordinate the various functions. Specialists were dispatched by Job Control and sent in trucks from a central location to perform specific jobs. A job could come to a halt simply because Job control had not dispatched the crew chiefs to open the panels prior to the arrival of the repair specialist. No repair specialist would open a panel—that was someone else's job.

In a centralized organization no one is responsible for the end product. As a result, each collection of specialties, or functional stovepipes, zealously guards its particular prerogatives. The specialties view each request from outside with distrust. Each incursion onto their turf is fought off with zeal. Each functional stovepipe regards itself as the key to the organization's success while denying any responsibility for its failure



*Figure 1: Aircraft Maintenance Unit Organization*

When General Bill Creech assumed command of Tactical Air Command (TAC) his first priority was to change its centralized structure. One of his initiatives was the creation of the Aircraft Maintenance Unit (AMU.) The new AMU owned the sortie generation process and had a direct stake in its success. The new structure created teamwork and empowered people. The change from a centralized, functionally organized maintenance structure to a decentralized AMU raised productivity by 80%. TAC added \$12 billion in combat capability simply by changing the organizational structure and applying rational, people centered management. (The AMU was only one of General Creech's initiatives and was not, by itself, responsible for all the improvements.) The dramatic improvement of TAC's combat capability led to the new organizational structure being adopted throughout the Air Force.

It would be nice if that was the end of the story. If the transformation was complete. If maintenance teams truly existed as envisioned by General Creech. But that is not the case. Senior leaders are so busy slaying dragons they cannot concern themselves with the lizards underfoot. After all, it is hard to get excited about the gecko on the wall when a dragon is trying to burn the house down.

The need for downsizing and reorganization is being driven by events. The aircraft fleet is aging and weapons modernization is a priority. It doesn't take a genius to realize we will experience fiscal austerity well into the next century. Finding the money to buy new weapons systems will likely require further cuts in manning levels. Those

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cuts are likely to come without a significant reduction in taskings. This reorganization plan will describe a way to restructure the operations squadron to increase efficiency, mission focus, and combat capability while decreasing the force structure.

## Centralization and Matrix Management

Despite the remarkable turnaround of TAC, the AMU was less than perfect. It had a divided chain of control, (so-called to distinguish it from the chain of command.) Production was the responsibility of the Production Superintendent (prod super) and the expeditors who worked for them. But while the prod super was responsible for the process, the people belonged to the maintenance flights. The prod super is tasked with control over production. The flight and section chiefs are tasked with assuring the quality of the work and the safety of the workers. In the maintenance organization only the people at the top, the Maintenance Officer and Superintendent, are tasked with the responsibility for production as well as quality and safety. (This does not mean that the prod super is unconcerned with safety or quality, only that the prod super's job description does not make those a priority.)

The AMU also maintained the functional divisions of the old large-scale, centralized management system. Portions of the Organizational Maintenance Squadron (OMS) became the APG, or "crew chief" flights. Portions of the Avionics Maintenance and Field Maintenance Squadrons (AMS and FMS) became the Specialist Flight. The munitions loaders from the Munitions Maintenance Squadron (MMS) became the Weapons Flight. This worked because the size of the flights was smaller. The coordination required could be accomplished at a much lower level than before. But the AMU was still functionally organized. The dragon of centralization had become a much smaller lizard, but the lizard was still underfoot.

The prod super is ultimately responsible for the end product yet has no functional control over the people. The flight chiefs have no actual authority over production yet bear some responsibility for it. Since this does not work, every squadron I have ever been in has created positions in the Specialist and Weapons sections that create a production chief in the functional specialties. For many years these positions existed on no official Air Force organization chart, yet every operational squadron had them. These positions are carryovers from the bad old days of centralized maintenance control, yet have become part of some MAJCOM maintenance organization instructions.

Some major command's (MAJCOM) instructions allow for a dispatcher as an intermediary between the sections and the flightline expeditors. The dispatcher is supposed dispatch workers to the jobs; the workers are then supposed to check in and out with the "real", or APG, expeditors. In reality the functions of dispatching people and controlling their maintenance is typically fulfilled by the functional expeditors who merely keep the "real" expeditors informed. The "real" expeditor is left with only the APG people to control, and by default becomes the de facto APG functional expeditor. In this manner each functional grouping ends up with its own expeditor.

The specialist flight often has several expeditors. The avionics specialists are typically dispatched from one truck, (sometimes called the launch truck,) and the accessories specialists from another. Sometimes this can get even more involved with the addition of an engine's expeditor. Who is responsible for whom? Suppose the prod super asks his expeditor for the status of a particular sheet metal job. The expeditor then calls the launch truck, but sheet metal does not work from that truck. The launch truck driver then has to track down the accessories truck, drive to the aircraft, or find the sheet metal specialist. The functional expeditor then relays the information through the "real" expeditor to the prod super.

The previous example is not far-fetched. This is typical of what goes on day after day. This is the reason why most expeditors, flight chiefs, and prod supers pop aspirin and Maalox® like candy. The confusion creates stress. The confusion creates the need for meetings to iron out the difficulties. The confusion creates the need for higher levels of authority to manage the competing entities. The confusion limits the productive capabilities of the workers. The confusion affects everyone's morale.

All this confusion is caused by matrix management. Matrix management is an attempt to overcome the centralized organizational structure by creating cross-functional lines of authority. Matrix management creates those confusing organizational charts with solid lines heading one way and dashed lines heading another. Whom do I work for? Whom do I supervise? It all depends on the task being performed. Matrix management is an attempt to maintain the centralized organizational structure yet create the efficiencies of horizontal organizations. (Matrix management is a violation of Air Force policy, as I will presently demonstrate.)

The ultimate effect of matrix management is the management of managers. The functional and production bosses need higher levels of management to coordinate their differences. You can see this for yourself by attending the daily production meetings needed to coordinate the activities and smooth over the differences between the functional managers, (section and flight chiefs,) and the production side, (prod supers and expeditors.) Eliminate the need for matrix management and you eliminate the need for so many layers of supervision and numbers of managers.

The so-called economies of scale created in centralized organizations actually create the need for additional levels of management. Matrix management increased the complexity of the organization and created the need for coordination. The centralized organization becomes top-heavy and unwieldy. The additional staff becomes a communications barrier, and the focus of management becomes the flow of paper, not the delivery of product.

Shortly after the Objective Wing reorganization, the Sortie Generation and Sortie Support Flights were created. The pre-existing flights each became elements of the new combined flights. The rationale for this new layer of management seems to have been to create a team focus to the sortie generation and sortie support processes. All it really did was add a new layer of management while failing to solve the problems created by the previously mentioned organizational flaws. The same problems still exist; they are just controlled and coordinated at a higher level. As I explain below, this runs counter to policies contained in Air Force Policy Directive (AFPD) 38-1 and Air Force Instruction (AFI) 38-101.

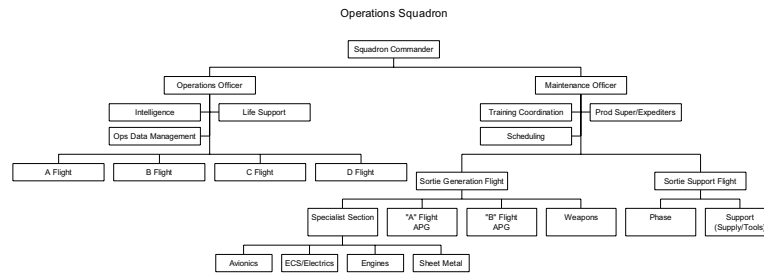


Figure 2: Operations Squadron after the Objective Wing Reorganization

## Centralization and Air Force Instructions

AFPD 38-1 outlines a set of basic principles for Air Force organizations. The directive sets forth the objective of simple, streamlined structures. The principle characteristics all Air Force organizations must share are: mission orientation, unambiguous command, decentralization, agility, flexibility, simplicity, and standardization. Everyone must have a clear job to do. Everyone must answer to one boss. Organizations should be as flat as possible.

AFI 38-101 expands on this information. Organizations must have one person in charge. Work must have natural divisions of responsibility. Organizations must be as flat as possible; intermediate organizations must have minimal staff functions, (skip echelon,) and must be tactically oriented.

AFPD 38-1 and AFI 38-101, while requiring clear lines of authority, (clear chain of command, one person in charge,) actually recreate the old divisions of authority within the Operations Squadron by dividing the production and functional chains of control, (see figure 2.) This seems to be accidental, more the result of tradition and inertia than a calculated attempt to subvert the intent of the instruction.

## The Deployment Model

Why are people more productive while deployed? They have fewer parts available, their facilities are often inadequate, and they often do not have the full range of diagnostic equipment or technical data available. The standard answers are: less supervision, fewer distractions, and experienced operators who only write up mission critical malfunctions.

All those answers have an element of truth. A deployed organization takes only minimal management overhead with them. The entire deployed organization is designed with sortie production in mind. Unnecessary management layers are left behind. A deployed organization is lean and mean.

While deployed for a short time, pilots will often “hip pocket” malfunctions. This makes it appear as though the aircraft are flying better. Everyone in maintenance is familiar with the phenomenon of working all weekend to repair aircraft that flew without malfunction during a short deployment or an exercise. The planes seem to develop multiple malfunctions on the last flight of the last day of an exercise or the flight home from a short deployment. On longer deployments ignoring malfunctions does not occur as often; it is too much trouble for pilots to work around malfunctions. Even so, it is remarkable the way the airplanes fly more with fewer malfunctions, and the malfunctions that do develop are fixed more quickly. What is the reason for this?

At one time only fully trained people were taken on deployments, and a case could have been made for that being the reason for the deployment’s relative success. The downsizings have proven this to be false. No longer are only

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fully trained people taken on deployments—their aren't enough of them.

People work together more closely when deployed. The barriers between the functional specialties come down, everyone knows what the ultimate goal is, and everyone pitches in to make it happen. The smaller size of the deployed organization helps as well; an organization of 50 people is more flexible than one of 200 can be.

The aircraft aren't being maintained better on TDYs because the people have fewer distractions. If anything, they have more. People are homesick. They miss their families. They have family crises that they aren't home to solve. They have troubles getting to and from work, and troubles getting meals. Some people also choose to use their off time to catch up on their favorite brand of debauchery. The "fewer distractions" argument is invalid.

The deployed organization is more efficient and effective because of its smaller size, its reduced management overhead, the reduction of the functional barriers between people, and the mission focus. If we accept those as a given, if we think we shouldn't operate one way in peacetime and another way in war, then we should try to design the operations squadron to mimic those features and gain those benefits.

## The Exercise Model

Perhaps the most telling example of the failure of the current maintenance structure is the way we change it during an exercise. All aircraft maintainers are familiar with Integrated Combat Turnarounds (ICT) and deployment or employment exercises. Most of us are curious about or even angered by the differences between the way maintenance is accomplished while in the exercise mode and the way it is done normally.

During an ICT a ranking specialist is the Area Turn Supervisor (ATS) and a senior NCO is the Combat Turn Director (CTD.) The ATS is responsible for one aircraft only; the CTD is responsible for as many as four ICT spots. The CTD is responsible for briefing the ATS about what to expect and do during an ICT. The CTD must be involved and readily accessible. The CTD is *not* the same person as the expeditor or prod super, but comes out of a functional area. This is much different from the normal way of doing maintenance because someone from the functional area is overseeing the maintenance. The hazards involved require someone be involved with the ICT whose primary concern is for the safety and quality of the work, not just the work's accomplishment.

During a deployment or an employment exercise a senior NCO from the functional area is placed in control of maintenance on a manageable block of aircraft. They are placed in the chain of control between the "real" expeditors and the maintainers. This is done because the amount of work being done during a simulated or actual deployment is too much for the expeditor to control, and because the number of inspectors or evaluators on the flightline forces production to give equal priority to the quality of the work as well as the quantity. When it counts—during an employment or deployment, either actual or exercise—placing someone from the functional chain into the production chain is the way to go.

The exercise maintenance model is flawed, however, because it leaves the existing structure in place and creates a new layer of management. This is less than ideal, but the basic idea has merit. Combining the production and functional lines of authority into one and sub-dividing the flightline into manageable blocks is a concept deserving of further development.

## Creating the Ideal organization

Over the last several pages I have attempted to explain the need for a change to the organizational structure of the operations squadron. I have also hinted about what the ideal organization should look like. It should be much flatter with fewer layers of supervision. It should make one boss responsible for people and production. It should eliminate the functional barriers that currently separate people. It should be more readily deployable. It should produce an environment conducive to mission focus.

These are grandiose goals, yet they are readily achievable. The solution is to restructure the operations squadron. Restructuring is similar to a process called reengineering. In both processes you take a fresh look at the organization, determine the key outputs, and then design the best way to accomplish those key outputs. Reengineering takes a clean sheet of paper approach to the organization. Restructuring is not quite as radical; it takes the current structural elements and rearranges them. Since restructuring is less radical, it is more politically palatable than reengineering.

If size is the only problem, if organizing small is the only solution, why not create large numbers of small squadrons? The answer is complex. Every operations squadron needs certain functions. Creating more and smaller squadrons would require those functions be duplicated and actually increase manning. More squadrons would require more commanders, first sergeants, clerks, schedulers, life support specialists, etc. Larger squadrons are not the answer either. A large organization creates overhead. The larger the organization the more likely it is to need multiple layers of management. The larger the organization, the more likely it is to organize by function. How then do we create the benefits of smaller squadrons, (team focus, fewer layers of supervision,) with the advantages of medium sized squad-



rons, (optimum percentages of managers and support personnel.) How do we, to paraphrase General Creech, “Think big, organize small?”

The answer is to create cooperative maintenance teams with assigned aircraft.

## De-centralized Aircraft Maintenance Teams

I propose to break up the specialist and crew chief sections and recombine them into maintenance teams, a.k.a. Maintenance Flights. Each operations squadron would contain several of these teams; the number of the teams would depend upon the size of the squadron. A small helicopter squadron might need only one or two. A large fighter squadron might need four or more. These teams would be small enough to be readily managed, yet because they are part of the existing squadron would require no increase in the support structure. The smaller teams would work together much as currently happens while deployed.

I propose to eliminate the Sortie Generation and Sortie Support Flights altogether. They are an unnecessary layer of administrative rework and a violation of the organizational principles in AFD 38-1 and AFI 38-101.

I would change the job descriptions of every one in the chain below the maintenance officer to include the responsibilities for training, quality, safety, and production. The maintenance flight chiefs would become part of the production chain. The expeditors, instead of working for the prod supers, would work for and be responsible to the maintenance flight chiefs. The inspection section would once again become an element under the maintenance officer. The support and weapons sections would become the Support Flight and the Weapons Flight. The dual chains of authority would be eliminated, and the constant tug-of-war between quality and quantity would be eliminated.

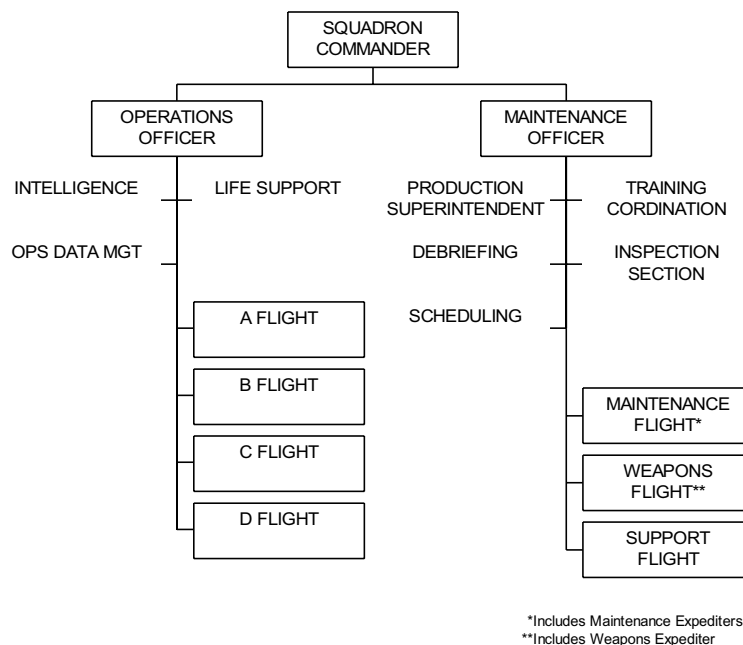


Figure 3: Restructured Operations Squadron

One way to think of this change is to envision the two separate chains of control. The current production chain runs from the Maintenance Officer through the Production Superintendent and the Expediter to the worker. The functional chain runs from the maintenance Officer through the flights and sections to the worker. In our revised organization we rationalize these two chains. The Production Superintendents are the production assistants for the maintenance officer, but with an expanded job description take on the responsibility for and are rated on safety, quality, and support of training. The Flight Chiefs become part of the production line and must now reconcile the need for training, safety and quality with the need for quantity. The expeditors become production assistants for the flight chief, but take on the same expanded role of the production superintendent. The entire chain of command becomes responsible for production *and* people, for the quantity *and* the quality of the work.



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## Objections

One objection I have heard to this plan is the failure to integrate weapons specialists into the maintenance flights. There are four reasons for this: difficulties with manning, the weapons certification process, and issues of weapons safety and nuclear surety.

Weapons specialists are broken into three person crews and each squadron has just enough crews to meet its needs. The 1st Fighter Squadron, for example, flying F-15 C/Ds, generally has seven or eight load crews and one maintenance crew. All load crews are required to undergo quarterly load re-certifications, (quality evaluations,) and ICT evaluations as directed by the Operations Group Commander. Add in leaves, other appointments, and change of stations and at any given time only five or six crews are available; not enough crews to give each maintenance flight even one load crew per shift.

An additional problem with incorporating weapons troops into the maintenance flights is the problem of weapons maintenance. Typically only a few of the weapons specialists are assigned duties as weapons systems maintainers. In the 1st Fighter Squadron, for example, only four people are so assigned. Could we make do with only one weapons maintenance specialist per team? Of course not. Each maintenance flight would require an entire maintenance crew, a tremendous waste of resources.

Trying to integrate weapons into the maintenance teams involves issues more serious than manning levels. The recurring training requirements alone would make it difficult to cross utilization train (CUT) large numbers of people to perform weapons duties, and the need to stay proficient would prevent the weapons specialists from becoming CUT trained on other duties.

Any system we develop has to be able to handle fighters, bombers, helicopters, etc. Trying to integrate weapons into the maintenance teams would create new headaches dealing with weapons safety and nuclear surety. Do we really want untrained or minimally trained and certified people working with explosives on a part time basis?

The manpower and quality specialists have pointed out to me that the MAJCOM supplements to AFI 21-101 already allow the specialist and APG flights to be combined *at the discretion of the operations squadron commander*. The problem with doing this without implementing other structural changes is that it turns the specialist into assistant crew chiefs but does not help the specialists at all. This has been tried before with the engine specialists and it was finally declared a failure. The engine specialists were trained to be crew chiefs but few crew chiefs became competent engine repair specialists.

Specialists are repair oriented. Crew chiefs are service oriented. Combining the two entities without combining the functional and production chains of control will ensure that aircraft inspection and servicing will take priority over aircraft repair. Giving short shrift to aircraft repair is a bad idea and will create short term successes but long term headaches.

Some senior NCOs have asked me what I intend to do with the people left without jobs due to the elimination of the Sortie Generation and Sortie Support Flights. The answer is very simple; I do not propose to do anything with them. The Air Force has a variety of programs available to deal with issues arising from over-manning. Retraining and attrition would likely take care of any excess manning.

Another objection involves the disappearance of the launch truck. With the loss of the Specialist Flight the justification for having a vehicle and crew dedicated to launch and recovery disappears. Who would perform this function? The answer is simple: the expeditors would. The way the flightline works now is a violation of AFIs 38-101 and 21-101. The Air Force and MAJCOM instructions are quite clear. All maintenance is to be controlled and coordinated through the expeditor. By creating smaller maintenance teams we have created a situation allowing the expeditors to fulfill their job responsibilities.

The disappearance of the specialist flight raises other difficulties as well. Who manages the COMSEC program? How are classified systems re-keyed? How do we accomplish the SERENE BYTE and PACER WARE exercises? The answer is simple. We would still have one person manage the COMSEC program for the squadron as an additional duty. We could rotate the responsibilities of keying aircraft between the flights weekly. When a SERENE BYTE or PACER WARE exercise was announced the prod super could create a team to accomplish the tasks involved at the same time as he or she selected the aircraft. The protection and control of classified information is not a show-stopper, and all potential problems are simple management exercises.

## Summary

Now that we have dealt with some of the objections it is time to reinforce the expected benefits. Creating maintenance teams would eliminate the functional barriers separating people and hindering the development of mission focus. CUT training would become a natural part of the work environment instead of the unwelcome hindrance it is today. This restructuring creates a rationally organized squadron, one that is flatter, one that has reduced overhead,

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and with one boss responsible for people and production. The new maintenance teams would be small enough to be readily managed. The new structure would not have to be changed for exercises and deployments; people would train the way they are expected to fight.

Adopting this restructuring would benefit maintenance by reducing redundant layers of management and eliminating the dichotomy of the functional and production bosses. The elimination of functionally separated maintenance specialties would assist the creation of a true mission focus. This would benefit the operations squadron by creating a more logically designed, flatter, and more deployable organization. The ultimate result would be a more capable and combat ready Air Force.

The restructuring described in this paper is in three parts. The Air Force may examine and evaluate each part on its own merits, but for maximum efficiency all three should be adopted at once. First, we must reduce our management overhead by eliminating the Sortie Generation and Sortie Support Flights. Second, we must eliminate the distinction between the production and functional lines of authority by expanding the job descriptions below the maintenance officer; we must add the responsibility for training, quality, and safety to the production superintendents and expeditors, and add the responsibility for quantity to the flight chiefs; and we must make the expeditors part of the maintenance flights. Finally we must eliminate the inefficient separation of maintenance specialties by function and combine them into mission oriented teams.

If implemented separately these three proposals will not have the same effect. Eliminating the Sortie Generation and Sortie Support Flights would reduce the layers of management without solving the problem of the divided chain of control. Placing production into the chain of command without any other changes would increase the levels of management. Combining specialists and crew chiefs without the other changes would benefit the inspection and servicing functions but hurt aircraft repair.

These separate proposals will have a synergistic effect when implemented together. They will streamline the management overhead and focus the efforts of the entire maintenance side of the operations squadron into a mission focused, quality oriented, and production driven whole.

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- 1980 Bachelor of Science in Industrial Technology, University of Maryland
- 1983 Master of Science Computer Information Systems, Boston University
- 1985 Squadron Officer School, Maxwell AFB AL
- 1992 Air Command and Staff College, in seminar at RAF Lakenheath UK
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- 1980-1984 Chief, Maintenance and Munitions Manpower Standards Branch, Headquarters  
Air Forces in Europe, Ramstein AB, GE
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- 1987-1989 Air Force Manpower Resource Manager, Directorate of Plans and Resources, Headquarters United States Air Force, Washington DC
- 1989-1992 Chief, Manpower Office, 100 Air Refueling Wing, RAF Mildenhall, UK
- 1992-1994 Chief, Warplans and Productivity Branch, Headquarters Pacific Air Forces, Hickam AFB, HI
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# Communication *and the Air Staff Restructure*

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Maj. Joseph Crilley  
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This paper outlines the importance of organizational communication during a corporate restructure. It uses the recent reorganization of the Air Staff at the Pentagon as a model to demonstrate the types of communication that are critical to a successful reorganization.

This paper is intended to provide an overview of how communication was demonstrated during a recent Air Force restructure. Communication was selected as the central theme because it was a primary reason for the successful design, coordination, and implementation, of the restructure. Communication was involved in all aspects of the process, to include leadership, participation, motivation, managing change, etc.

General topics discussed in this paper include the importance of communication, upward, downward, lateral, electronic, and informal communication. Examples of similar actions by private corporations will also be discussed where appropriate. We will begin with a brief overview of how the Department of the Air Force was organized and what changes occurred as a result of the restructure. We will discuss how the Air Force restructure can be used as a model to demonstrate several important aspects of communication.

The restructure involved the Headquarters, United States Air Force (HQ USAF). Organizationally, the Headquarters United States Air Force (located in the Pentagon) has two distinct parts. The senior part is comprised of the **Secretariat**, headed by the Secretary of the Air Force. Reporting to the Secretariat is the **Air Staff**, headed by the Air Force Chief of Staff (CSAF). The restructure discussed here involves only the Air Staff part of the Headquarters. The Air Staff is responsible for managing Air Force programs, developing policy, planning and allocating resources. The previous Air Staff structure consisted of four major "Deputy Chief of Staffs (DCS)," one "Assistant Chief of Staff (ACS)," and various other smaller offices. The chart below depicts the Air Staff structure prior to January 1 1997.

Major changes included; elevating the Directorate of Programs and Evaluation to the DCS level and realigning long range planning to it (new name "DCS Plans & Programs"). Its long range planning capability was enhanced with the realignment of all Air Staff long range planning functions to this new DCS. The ACS Intelligence was realigned into, what was, the DCS Plans and Operations. Then Plans and Operations was renamed "DCS Air and Space Operations." This strengthens its support to worldwide commanders by structuring itself around the Air Force core competencies. Several smaller offices, to include Civil Engineering, Maintenance, Supply, and Transportation were realigned under the new DCS Installations & Logistics. This new DCS acts as the champion for issues that affect base-level support issues. The Security Police office was strengthened and renamed "Security Forces," due to changing world threats. The DCS Commu-

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nications and Information was changed to an “office,” with a majority of its responsibilities and people moved to Rosslyn VA. New changes are reflected in the chart below:

It became very obvious early on during this restructure that proper communication would be absolutely critical to its success. Since this reorganization involved a “staff” of people who were already very well versed at communication skills, any lack of communication would have serious negative consequences on the probability for success.

Management and communication of this restructure was achieved through, what was previously, the Director of Programs and Evaluation, or **AF/PE**. AF/PE is headed by a 2-star general officer. One of the divisions under AF/PE is AF/PEO, “Organization Division.” AF/PEO’s primarily responsibility is to manage Air Force organizational actions. It was therefore logical that the CSAF asked AF/PE to lead the reorganization effort. One of the first actions AF/PE did was to develop and communicate a concise objective statement:

“Promote clear lines of responsibility, authority, and accountability within the entire staff.” (1)

AF/PE was deemed the central and formal point-of-contact on all coordination regarding the changes under consideration. Of course, there were many informal channels of communication as well. It is also important to note that a lower ranking officer was not asked to lead this restructure. A 2-star general was needed to effectively manage the multitude of, sometimes conflicting, agendas involved in reshaping the Air Staff. Additional detail on AF/PE’s role in managing and communicating these changes will be provided within this paper.

The importance of communication during this restructure cannot be overstated. Restructures involve change. Change produces a variety of responses from the people. Some responses are positive, while others can be either neutral, or negative. Effective communication can help lessen the negative responses to change and even convert opponents of the proposal to supporters when done effectively. Another important aspect of communication on a HQ staff is:

“The more an organization is people- and idea-oriented, the more important communication becomes...The process of communication is by definition a relational one; one party is the sender and the other the receiver at a particular point in time.” (2)

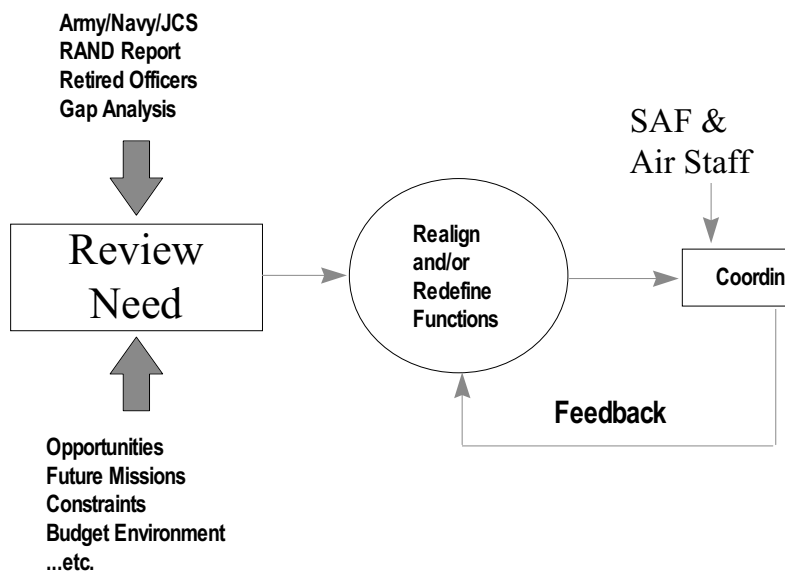
Also demonstrated during the communication of this restructure was the principle of **layers of communication**. This was especially evident in a military oriented staff due to the formal rank structure. Communication was developed and passed upward or downward in a relatively formal process of coordination. At times communication was modified in both directions depending on the issue being negotiated. These modifications were usually well documented, but sometimes (especially in downward communication), there was no formal coordination effort. The overall process of communication and coordination is shown in the diagram below. Initially, inputs were collected from both within and outside the Staff. Then coordination involved a series of draft proposals being briefed to senior Air Force leadership (SAF, CSAF, etc.), with their feedback

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resulting in sequential changes until a final structure was reached.

1. *Air Staff Reorganization* briefing, Organization Division, HQ USAF/XPM
2. *Organizations, Structure and Process*, Robert H. Hall, page 268

## Methodology



**Downward Communication** was one of the most important parts of the reorganization effort. Most of the changes implemented during the Air Staff restructure were a result of downward communication and direction. Changes were not driven by technology or society for the most part, but were directed based on the leadership's reevaluation for the current Air Force mission and what its future mission would be. The Staff's characteristics can be generalized as *administrative* vice *technical* and more *mechanistic* than *organic*, therefore most changes came from the top:

"Technical change is facilitated by a bottom-up process and an organic structure. Organizations that must frequently adopt administrative changes tend to use a more top-down process and mechanistic structure. In tightly structured mechanistic organizations, innovations are initiated at the top and implementation is downward." (3)

Downward communication also included communication to the field. As discussed previously, the Air Staff is part of Headquarters Air Force. Under the Headquarters are nine subordinate major commands (MAJCOMs). These MAJCOMs are located both in the United States and overseas. Downward communication was important because the MAJCOM

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staffs were encouraged to mirror the structure of the Air Staff. In order to implement these changes, the MAJCOMs needed to know what changes were taking place and the rationale for the changes. Initial communication between the Air Staff and the MAJCOMs on the reorganization happened in the early fall of 1996. This

**3. *Organization Theory and Design*, Richard L. Daft, page 281**

involved a briefing by the CSAF to the MAJCOM commanders (primarily 4-star generals). From that point on, a dialogue began between the Air Staff and the MAJCOM staffs regarding the latest decisions made regarding the new structure. This communication increased as each functional office at the MAJCOM began contacting its counterpart at the Air Staff to find out what was happening in their area.

There was also downward communication within the Air Staff itself. On 17 Oct 96, the Vice CSAF sent a memo to the Staff asking them to work the restructure quickly:

“The Secretary and CSAF approved undertaking a major reorganization of the Air Staff at CORONA Fall 96. The new structure will improve alignment of responsibilities and core processes. It is designed to help build the future Air Force...An Integrated Process Team (IPT) is being formed to work the detailed plans for the restructure. This effort should last no more than two weeks.” (4)

A legislative part of the communication process was, and continues to be, **downward communication from Congress** to the Office of the Secretary of Defense and the Department of the Air Force. In a letter from the Committee on National Security to the Secretary of Defense, Congressman Floyd wrote:

“Organization/structural reform - In the National Defense Authorization Acts for fiscal years 1996 and 1997, Congress provided specific legislative direction in the area of acquisition workforce reductions, streamlining the Office of the Secretary of Defense and headquarters staffs.....Witnesses should be prepared to report on the status of the Department’s compliance with these specific legislative requirements and what other steps are being taken to reduce the overhead costs associated with the Department’s overly developed management structure.” (5)

**News and press releases** can help promote support for restructures, especially in the private sector and with stock holders. For example, in a 20 Sep 95 AT&T news release, titled “AT&T announces major restructure for the 21<sup>st</sup> Century,” Chairman Robert E. Allen stated:

“Changes in customer needs, technology, and public policy are radically transforming our industry. We now see restructuring as the next logical turn in AT&T’s journey since divestiture. It will make AT&T’s businesses more valuable to our shareholders, even more responsive to our customers, and better able to focus on the growth opportunities in their individual markets.” (6)

**4. *Air Staff Reorganization*, Vice CSAF memo, 17 October 1996**

**5. *Committee on National Security memo*, 18 February 1997**



**Upward Communication** was an expected part of the coordination process. Since the Air Staff reports to the Secretary of the Air Force (SAF), AF/PE gave update briefings to several SAF staff offices. Of primary concern was that the Air Staff keep the SECAF fully informed since SECAF would be the structure's final approving authority. This effort involved AF/PE providing SECAF several "table top" briefings on the proposed structure at key phase points. These briefings were provided from start to finish in order to provide SECAF the latest information in a very dynamic effort. This communication effort recognized the importance of gaining senior leadership's participation early in the restructure.

AF/PE also developed an upward communication strategy for informing Congress. Congress is very interested in major reorganizations of the military Services. This is because the Congressional staffers monitor several aspects of the Services' headquarters, to include the number of general officers, outsourcing efforts, etc. Congress is especially concerned with limiting the size of the Services' management headquarters total manpower, as it is often perceived to be disproportionately large in relation to more operationally related manpower. Informing Congress of major changes to the structure is imperative in maintaining a cordial and effective working relationship with Capitol Hill and, in some aspects, is mandated by law. Therefore, on December 6 1996, AF/PE sent a memo to the office in the Secretariat that liaisons with the Congressional staffers (i.e., SAF/LL). The memo requested help in notifying the required Congressional offices. SAF/LL then made a formal announcement to Congress on 17 Dec 96.

There were some difficulties associated with upward communications. Due to the relatively large amount of information being staffed and coordinated, the problem of **delay** was evident in flowing information up to the CSAF. Some inputs to the CSAF came from one staff below (i.e., the Air Staff), while other came from two staff levels below (i.e., MAJCOMs). This process also involved some **filtering** of information. However, neither delay or filtering negatively impacted the type or amount of data the CSAF had available to make his final recommendation to SECAF. In fact, it was CSAF's eagerness to hold **meetings** on the subject that helped demonstrate his willingness to **listen** to all concerned parties. This effort was instrumental winning the support of the entire staff.

In complementing upward and downward communication, the Air Force also initiated **lateral communication** with several organizations. These organizations were neither in the upward or downward chain of command, but had some relationship with the Air Force that made communication with them a sound business practice. For example, AF/PE provided interviews to the *Defense News*, the *Air Force Times*, and the *Airmen Magazine*. These media organizations played an important role in disseminating information about the restructure to various sources outside the Air Force. These sources include retirees, the aerospace industry, foreign governments, political organizations, and personnel in remote locations. In the private sector, it is often important to communicate with stock holders, especially those actions involving restructuring. A restructure at Sensormatic Electronics Corporation was communicated in the follow way:

"During fiscal 1996, the Company initiated a restructuring plan with the following objectives: (I) expense reduction and asset control, (ii) improve



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processes and systems, and (iii) quality growth. The initial phase of this plan included an extensive review of the Company's operations and cost structure. As a result, the Company recorded restructuring charges of \$85.3 in the second and third quarters of fiscal 1996, primarily for product rationalization and related equipment impairment charges, facility closures and severance costs." (7)

A relatively new and effective means of communications involves **electronic communication**. The primary system for accomplishing this was the Air Force local area network (LAN). The LAN was the backbone for delivering critical **Email** to all staff offices. Email was used extensively in coordinating the details and design of the Air Staff restructure. Email was particularly effective because the Pentagon is one of the largest buildings in the world. The Air Staff offices affected by this restructure are located at various locations in the building. For example the Security Police office is in the basement, while the others are located on all of the other five floors of the building. Additionally, the Air Staff is known for its hectic pace and frequently scheduled meetings. This environment makes Email one of the best ways to communicate. It allows the user to send messages anywhere in the building, saving valuable time and "shoe leather." The users can send an Email without leaving their office and address multiple recipients at once. This is popular because it eliminates wasted time walking around the building to see people, or calling people who may not be at their desk. Email also provided AF/PE a record of the decisions made and the names of the action officers involved.

The LAN also allowed transmission of documents necessary to finalize the new structure. Draft documents and charts used in designing the reorganization could be reviewed by the receiver, then edited/updated and sent back to AF/PE for consideration. Especially useful was software that integrates Email with the capability to attach documents and graphic products. This capability allowed AF/PE to transmit the latest version of the draft structure to the office across the hall or to commanders in Europe and the Pacific, all from the action officer's desk.

In an environment of reduced resources, electronic communication can often save money in addition to ensuring effective communication. One example of this is the use of video-conference equipment. This equipment was used to brief the new structure to the acting commander of the Air Force Center for Quality and Management Innovation, in San Antonio, Texas, from the Pentagon. The conference involved establishing a high-grade telephone connection between two conference rooms that had the video-conference

7. *Sensormatic Quarterly Report*, Edgar Online, quarter ending 31 Dec 96

equipment. The briefer saw both himself and the distant audience on two televisions. This arrangement saved time and money because the briefer never had to leave the Pentagon.

The use of electronic communications was evident in the memo mentioned previously from the Committee on National Security in which the Secretary of Defense was requested to testify on "organization/structural reform." The conclusion of the memo stated:

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“In addition, consistent with the House rules requirement to make materials from hearings electronically available to the general public, Committee Rule 13 requires that witness statements be provided to the committee in electronic form. It is therefore requested that along with the hard copies of your statement, you also forward an electronic copy on a 3.5 inch MS-DOS diskette, either in Microsoft Word, ASCII or DOS text format.” (8)

In conclusion, we have seen how critical and complex communication can be in reorganizing a staff structure. This was especially true of the Air Staff because there were nearly 3,000 people involved. The factors involved in communicating effectively between this many people and staff offices were infinite. Fortunately, leadership took several proactive steps in addressing the communications issues head-on. First, they gained Staff involvement early on in the “designing” phase. They asked for feedback throughout the change process. They also ensured their customers were involved in the structural design — since the customer is really the “person” who must live with the results. They gained support through the news media and with formal public announcements to Congress, etc. The use of technology enhanced the entire process and expedited the learning, support, and implementation roles of all those involved. The success of this restructure is a result of several factors, including, leadership, participation, motivation, effective management of change. However, all these factors centered around one key element – effective communication.

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Note: Charts and diagram used where from the *Air Staff Reorganization* briefing listed above.

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Capt. Cunningham

Captain Cunningham graduated from the United States Air Force Academy in 1993 with a degree in English. He served as Officer in Charge of Plans and Programs at the 652d Combat Logistics Support Squadron at McClellan AFB, California, then moved on to become a program manager at the U-2 Management Directorate, Robins AFB, Georgia. He is currently assigned to the Commander's Action Group at Robins.

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## Of Repair Cycles and Mutual Trust: The Redefinition of a Government-Contractor Relationship

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**Capt. Doug Cunningham**

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*Abstract: The United States Air Force constantly seeks to streamline and fine tune the repair cycles at their contractor's facilities. As good as these intentions are, however, turning eyewash into reality often proves extremely difficult. For years, the concepts of Lean Logistics have echoed in the hallways of military management, yet few organizations can actually point to concrete proof that all their overhauling efforts have actually yielded positive results. With the right approach, however, military program managers and contractors can work together to solve expensive repair cycle problems. The case study which follows will demonstrate the effectiveness of one such approach. This approach itself has three distinct parts: first, government and contractor personnel must agree on the problem; second, an objective "third set of eyes" must evaluate the current process and recommend solutions; finally, government and contractor personnel must establish goals and follow ground rules.*

Merry Christmas! You've just awakened your parents from a peaceful slumber and dragged them to the tree in the living room. You rip into the first present — the one whose contents you secretly suspected for weeks ... Yes! A motorized G.I. Jack HumVee Transport! You slide the batteries into their assigned slots, flip the start button to the Drive position and—! Nothing. Why? Simple—the start switch snapped apart. The HumVee won't start without it. As if that weren't bad enough, your parents can't find the receipt to return the item! Now what? You'll have to rely upon the repair cycle back at the manufacturer's depot. Goodness knows that will take forever!

Many such frustrated children grow into frustrated adults when they experience similar problems with much bigger toys. Of course, on the adult playground, long lead times or high turnaround times for repairs can have much greater consequences. For this reason, the United States Air Force constantly seeks to streamline and fine tune the repair cycles at their contractor's facilities. As good as these intentions are, however, turning eyewash into reality often proves extremely difficult. For years, the concepts of Lean Logistics have echoed in the hallways of military management, yet few organizations can actually point to concrete proof that all their overhauling efforts have actually yielded positive results. With the right approach, however, military program managers and contractors can work together to solve expensive repair cycle problems. The case study which follows will demonstrate the effectiveness of one such approach.

This approach itself has three distinct parts: first, government and contractor personnel must agree on the problem; second, an objective "third set of eyes" must evaluate the current process and recommend solutions; finally, government and contractor personnel must establish goals and follow ground rules. (Although based on actual organizations and circumstances, for the sake of this paper, we shall deem the aircraft management directorate as LX, and the contractor shall be called Halltech, Incorporated.)

First, government and contractor needed to agree on the problem. In 1996, LX, an organization responsible for logistical management of a particular military airframe, began to feel the bite of decreasing budgets and the classic higher management demand to "do more with less." One way to cut costs, LX management reasoned, could be a dramatic reduction in repair turnaround times (hereafter to be referred to as TAT). Although LX worked with several contractors, most of

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whom took between 100 and 200 days (on average) to return an item to the field, LX management felt that a successful pilot program with one contractor might set a positive precedent for the others to follow.

LX management met with key personnel at Halltech. One of the biggest obstacles to the success of this venture, LX reckoned, would probably be resistance among the higher management of this profit-oriented company. Surprisingly, however, Halltech's higher management—to include the company president and all of his key vice presidents—embraced the need for change and the opportunity to improve their procedures. Halltech saw LX wishes as a chance (or perhaps even as an excuse) to reorganize some basic philosophies. LX suggested that TAT be reduced from 120 days to 60 days by the end of fiscal year 1997. Halltech responded—perhaps a little hastily—by saying they would attempt to cut their in-plant TAT to only 30 days by the end of calendar year 1997. Certain LX personnel laughed at this (and continue to laugh to this day), but the contractor nevertheless demonstrated a desire to improve. Halltech's efforts did not, however, yield immediate results. While LX managed to secure contractor “buy-in” at the highest and lowest levels (many of the actual “floor” workers—repair or diagnostic personnel—felt the coming changes to be long overdue), buy-in at the middle-management level did not prove so simple. For months, Halltech middle management struggled with some basic questions: Who would lead the TAT reduction effort? Should the responsibility for this initiative fall under program management or some other department? Did LX really mean what they said about TAT, or was all of their rhetoric on this topic simply eyewash?

In addition, LX experienced difficulty in obtaining a regular “reporting format” from the Halltech TAT reduction management team. From the beginning, LX felt that a simple series of metrics would help tremendously in tracking the time a particular part spent in-plant. Halltech, however, could not decide among themselves on a consistent way to measure their data. For weeks, the LX project officer solicited quantifiable inputs from Halltech, to no avail; when he did receive some tentative metrics, the methods used to arrive at the associated figures remained unclear. (Which parts did Halltech track? What was the average time parts spent in-plant in the repair process? Were return-to-vendor items tracked the same way as other parts?) The most basic metric requested by the LX project officer proved to be the most elusive—a chart tracking the average TAT for repairs on a monthly basis (see Attachment 1). This particular metric underwent countless changes before reaching a calculation method and format with which both LX and Halltech felt comfortable. By the time LX needed to begin briefing results to the local general, the reporting format became much more solidified. Both Halltech and LX owed their thanks to a consultant—a “third set of eyes”—for leading the way through undiscovered country.

At the beginning of this dangerous journey, LX management felt the need for an experienced navigator—someone who knew these rough seas, someone who had been there and survived. Having worked with Calypso Enterprises (as we shall call them) on a previous project, LX management suggested that Halltech management meet with Greg, an engineer and program manager at Calypso who specialized in fault isolation and testing processes. (LX did not “promote” or “push” Calypso onto Halltech; rather, Calypso had recently undergone major TAT reduction efforts of its own, so LX felt Halltech might benefit from hearing a briefing by Calypso and having Calypso take a quick walk through Halltech's repair process.)

LX arranged and attended the initial meeting with Greg and Halltech managers. Greg briefed Halltech on Calypso. After touring Halltech's repair process with LX and Halltech personnel, Greg stressed that Calypso was not a consulting agency; rather, he felt that Halltech could benefit from some lessons learned by Calypso while undergoing similar changes. Impressed by Greg's

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acumen, Halltech—of their own accord—contracted Calypso to consult on their TAT reduction effort. Greg stressed that if Halltech were to hire him as a consultant, LX would need to respect the privity between Halltech and Calypso. (Note: For the most part, Halltech wanted their problems identified, so privity did not prove as big a problem as initially thought.)

Most of the lag that occurred in the initial phases of the program (e.g. the aforementioned problems with the reporting format) occurred because Halltech had not yet placed Greg on contract. Once Calypso arrived in-plant, the progress already made at Halltech became much more recognizable and tangible. Greg proved invaluable in Halltech's efforts to identify problems, implement new testing technologies, and develop worthwhile methods to track progress. He also served as a sort of liaison between Halltech and LX, smoothing out problems and misunderstandings, and generally keeping communications open. Although LX personnel felt concerned about how Halltech might operate once Greg's contract ran out, they decided to leave continuation in Halltech's hands. (Incidentally, Halltech operated just fine after Greg's departure!)

By leaving the accomplishment of TAT reduction goals in Halltech's hands, LX found itself able to monitor the magic from a comfortable distance (this distance proved comfortable for the contractor as well)! This "hands-off" approach, which concerned itself with the end product rather than the intermediate processes, stood as only one of several ground rules set at the beginning of this effort. All parties felt that Halltech's "dirty laundry" needed to be washed—they didn't concern themselves with which soils stained the shirts or how they got there. The emphasis here needed to be on solutions rather than blame, and creating an environment where this emphasis was taken seriously resulted in a greater trust between government and contractor.

Another ground rule for the effort was the understanding that the government should not have to "spend money to save money," as LX management so keenly stated. While Halltech found opportunities to solicit more funding for facility upgrades (which they argued would improve TAT), LX management stuck by the "no-additional- funding" ground rule. Even Calypso's fee came out of the original contract. Perhaps the most important ground rule between LX and Halltech came in unwritten form—an attitude of mutual faith and trust. While these somewhat "fuzzy" terms come across as rather sentimental, trust between government and contractor can be difficult to come by—not to mention a serious obstacle to any kind of real progress. While this trust became stretched at times, Halltech's good will and LX's "no-finger-pointing" management approach appeared to be a match made on high. Here's one lesson LX can try to carry to the other contractors!

Did this new-fangled, hands-off management approach work for LX? Please reference Attachment 1—the latest version of the infamous TAT metric. This metric charts Halltech's projected average in-plant TAT per month against their actual average in-plant TAT per month. The chart shows an increase in average TAT for the months of December and January because of an increase in the shipping of pre-FY97 backlogged items during those particular months. As these aged, backlogged items were removed from the inventory, the average age of the items in the inventory decreased—hence the reduction in the TAT average in February and beyond. Of course, shipping an item with 300 days attached to it invariably causes the TAT average for that particular month to increase because the TAT average is based upon the items *shipped* during that particular month (hence the increased averages during the months of June and July—four aged items were shipped out during these months). The key to this entire effort proved to be a focused attack on the inventory; given this fact, LX viewed these peaks in the curve as good news, because increases in TAT reflected a decrease in the backlogged inventory. Even with these temporary increases, Halltech is still achieving a TAT average below the projected average!



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Both LX and Halltech needed to identify which steps in the process caused the most problems. Delays in such areas as receiving and shipping proved relatively minor, but parts bouncing around from one building to another two or three times caused days to pile up. These minor problems were among the first to be addressed. Halltech's biggest lag occurred when holding for materials. Recently, Halltech sent out letters to its vendors, asking for their cooperation in helping to reduce TAT. While some responded by saying they would help, most didn't feel that Halltech took up enough of their business to justify making any major changes to their current processes or lead times. In instances such as these, Halltech was left with very few options. These problems continue to be worked. The TAT reduction effort is still underway, but so far LX is proclaiming this initiative as a success story. Granted, slight changes have crept into the goals along the way (for example, Halltech decided to state that only 95% of their repairs would leave plant after 30 days—probably a wise declaration considering the long lead times for certain return-to-vendor items). In the grand scheme of things, however, these changes seem like small, necessary concessions. All parties involved set some very high goals, and achieving those goals will require some compromises and understandings.

LX briefed Halltech's progress on this initiative at a conference for all LX contractors. All in attendance were told that similar changes would soon be expected at their facilities. Many individuals in the audience scoffed and laughed, but several—like Halltech—recognized how improvements in this arena would not only satisfy LX business needs, but the needs of their other customers, as well. Recently, LX management took this success story on the road to several other high-value, high-volume contractors with high TAT. These contractors expressed concerns about how these TAT reduction initiatives would affect their costs or processes, but LX assured them that an immediate, 50 percent cut in TAT wasn't the primary goal; the primary goal was to get the contractors to understand their inventory and why their times were so high. LX also stated that the contractors didn't carry this burden of improvement alone—LX wanted the contractors to help identify where hold-ups might occur on the government end (one oft-cited example was the LX habit of shipping repairs to the contractor in bulk versus shipping fewer repairs on a more regular basis). Almost all of the contractors visited expressed a genuine desire to work with LX to cut their TAT, and the proven, three-step approach—state the problem, bring in a “third set of eyes,” and establish ground rules—will undoubtedly yield effective results again. The key to such an effort is the establishment of a positive attitude on both sides from the beginning. As always, honesty is the best policy, and contractor attempts to stash “dirty laundry” only breed an atmosphere of greater mistrust. Similarly, government must be willing to accept that contractors do not always have to fit the “money-hungry” mold; after all, they have a marked interest in national security, too! Tell that to some frustrated kid on Christmas morning, right? Perhaps the makers of that G.I. Joe HumVee could learn a few lessons from Halltech, Calypso, and the United States Air Force!

#### Acknowledgments

I am indebted to Major John Hancock for developing the project and for several of the “catch phrases” quoted in the paper. I am also indebted to the contractors (the names of which shall remain unmentioned) for the development of Attachment 1 and their overall cooperation on this project.



## **Dennis J. Foth**

Mr. Foth is the Project Leader and Systems Engineer responsible for the configuration, acquisition and distribution of over 1100 interactive multimedia training systems at over 500 locations worldwide. He is the Executive Producer for interactive multimedia training programs, managing the planning, design, development, production, testing, evaluation, and implementation of courseware in areas such as aircraft rescue and fire fighting, hazardous materials, confined space rescue, emergency medical technician, force protection, and explosive ordnance disposal.

Mr. Foth is a member of the International Aircraft Rescue Fire Fighting Working Group (ARFFWG) and a former faculty member of the International Association of Fire Chiefs. He has a distinguished career in developing multimedia training applications for fire protection personnel.

Mr. Foth is an industry leader and has written many papers on the acquisition of multimedia hardware, the development of courseware, and the use of the technology to enhance fire service training. Award winning papers have appeared in international publications and presented a major forums throughout the world, including the International Training and Education Conference in Europe (The Hague, Netherlands and Lausanne, Switzerland); ITEC Asia (Singapore, and Kuala Lumpur); the International Fire Chief's Association of Asia (Bangkok), The World Multimedia Conference (Las Vegas), and Fire Rescue International, Dallas, Texas. As an internationally recognized expert in multimedia hardware and courseware for training and education programs used in business, industry, government, and education, Mr. Foth serves on the European and Asian International Training and Education Conference committees. The committees are comprised of twenty-five prominent members of the training, education, and simulation community representing government, industry, and academic interests.





### **Wade H. Grimm**

Mr. Grimm is the Program Manager for the Fire Fighter Multimedia Training System, Aeronautical Systems Center, Air Base Operability. He is a member of the International Association of Fire Chiefs and the Aircraft Fire Fighter Working Group. He is an industry and Government leader in the field of multimedia for emergency response training applications, managing over 50 interactive courseware titles. The multimedia hardware and emergency response courseware provides training and education material to all Air Force Fire protection personnel worldwide.

As Program Manager, Mr. Grimm is responsible for recommending policy and procedures for multimedia hardware and courseware for the entire Air Force Fire Protection community. He is a key industry liaison between the Government and the commercial world and leads technical efforts to ensure both industry and Government can share course material. As an industry leader, Mr. Grimm was the first to field a major system acquisition that was fully compliant with the Interactive Multimedia Association's Recommended Practices for Multimedia Portability.

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# Effective Use of Distance Learning Technology for Emergency Response Training

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## “A Success Story”

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**Lorraine T. Coleman**  
HQ USAF/XPMR

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Aeronautical Systems Center

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### ABSTRACT

*Abstract: Incidents such as a military B-1B bomber diverted to Frankfurt International Airport Germany, or a civilian MD-11 commercial airliner diverted to Wright-Patterson AFB, Ohio demonstrate that in an emergency, a civilian airliner might have to land at a military airfield, or a military aircraft land at a civilian airport. When this happens, firefighters and first response personnel must be familiar with emergency procedures for the aircraft in question, regardless of origin. Their knowledge of rescue, entry, exit, shutdown, tactics, and other emergency procedures is critical to saving lives and property. But how do personnel receive training on aircraft that are rarely seen or, because of mission or economic considerations, cannot sit idle for training purposes.*

*To ensure emergency response personnel receive aircraft training that might not otherwise be available, interactive multimedia training systems are being used for aircraft familiarization training. Interactive multimedia training system provides critical information about a wide variety of aircraft at a small cost. Potential users include civilian and military departments of both the United States and foreign governments.*

*The system provides aircraft familiarization training twenty-four hours per day, seven days a week, and may be used both before and after hands-on training. It also is a source for key information about aircraft that are not assigned to the fleet. In many cases, the multimedia training system may be the only training a person receives for certain aircraft. The course material could benefit pilots, flight attendants, ground crew, mutual aid fire departments, and others, and could prove very significant their ability to save lives and protect property.*

*This paper will cover the system components, features of the courseware, and benefits of this emerging technology.*

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## Introduction

Firefighters, like other professionals, require recurring proficiency training in a multitude of subjects, including aircraft rescue and firefighting procedures. However, severe restraints have been placed on rescue and firefighting training by environmental restrictions on the open burning of hydrocarbon fuel and use of halogenated extinguishing agents; the increased maintenance and fuel cost for firefighting vehicles; manpower requirements to conduct training; and the limited availability of training aircraft.

In an emergency, a commercial airliner or a civilian aircraft might have to land at a military airfield, or a military aircraft land at a civilian airport. Should this happen, firefighters and first response personnel must be familiar with emergency procedures for the aircraft in question, regardless of origin. Their knowledge of rescue, entry, exit, shut-down, tactics, and other emergency procedures is critical to saving lives and property.

To ensure firefighters receive aircraft training that might not otherwise be available, multimedia training systems are being used for aircraft familiarization training. Though not intended to replace live, hands-on training, this interactive multimedia training system provides critical information about a wide variety of aircraft at a small cost.

The system provides aircraft familiarization training twenty-four hours per day, seven days a week, and may be used both before and after hands-on training. It also is a source for key information about aircraft that are not frequently seen at the airport, but is essential to know in the case of an emergency situation. In many cases, the multimedia training system may be the only training a person receives for certain aircraft.

Because many countries fly a variety of civil and military aircraft, the training courses can be of significant value to all airports and emergency response personnel throughout the world and could prove very significant in saving lives and property.

To maintain essential firefighter proficiency, interactive multimedia training systems are being used to augment much of the hands-on training and provide knowledge-based information before a hands-on exercise is conducted. Training is available to students 24 hours a day regardless of the availability of aircraft, equipment, or instructors.

## What is Multimedia?

Multimedia is a term used in many different contexts. For our purposes, multimedia will be defined as the combination or integration of electronically generated computer text, graphics, still images, motion video, and audio linked together to allow interaction between the student and the information assembled in the course.

Instruction is delivered via a computer-based training program that relies on trainee input to determine the order and pace of instruction. As the trainee advances through the sequence of instructional events by making decisions and selections, the instructional material branches out accordingly. Steps and procedures are presented and demonstrated, then used in student exercises and tests to reinforce mastery of standard procedures and events.

## System Components

Two key components of multimedia are: (1) the hardware system, and (2) a library of courseware. The typical hardware system is comprised of a microcomputer, monitor, CD-ROM drive, and a mouse, all linked together in an interactive mode accessed through a menu system. Figure 1 shows a typical system.

Figure 1 - Multimedia Training System

The systems are configured using commercial off-the-shelf technology, so there are no unique hardware components. The courseware consists of a CD-ROM, applications software, and a user's manual. All courseware is designed and developed using standard instructional design processes.

### **COURSEWARE OBJECTIVES AND PURPOSE**

The key component of multimedia training is the courseware. Through the courseware, the instructional learning objectives are accomplished. The information is designed to augment the students' basic education and to provide additional or refresher material to enhance their performance. The courseware can serve several purposes. It can be used to prepare students for live instruction or live training by allowing a review of the multimedia material ahead of time. Also, it allows students to study and test their knowledge individually and on their own time after live

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instruction. In addition, the multimedia material can be used by instructors to supplement their lesson plans.

### **BENEFITS OF MULTIMEDIA TRAINING**

Interactive Multimedia (IM) is not a cure-all solution, but certainly has its place in an overall training program plan. It has been well received by students, instructors, and management. It provides constant and proven content and offers low cost per instructional hour for large populations.

Multimedia is providing trainers an answer to many of their required training tasks and can be used to teach a wide variety of subjects without direct student-instructor interface. Having the course on the computer ensures instructional consistency and requires less time in the classroom, allowing the instructor to devote more hours to remedial training and testing. Because students trained on multimedia need less remediation and course repetition, significant savings in resources can be realized in presenting live training. The following are some advantages of multimedia training from learning, instructional, and cost perspectives:

Reduced Learning Time. Many studies have shown that IM can reduce learning time by as much as fifty percent. Personalized instruction accommodates different learning styles to maximize student learning efficiency.

Increased Retention. Content retention is significantly increased as a result of student interaction with the instructional material.

Controlled Learning Pace. Students set their own pace, taking the most efficient path to master the content, skipping areas of strength while investing time in areas of weakness.

Immediate Feedback. Immediate feedback from the instruction reinforces essential technical procedures and processes. Students can activate controls, release handles, etc., and view the results of their actions on the video screen.

Instructional Consistency. All students have access to the same material, delivered in a consistent and reliable format that does not vary from class to class or school to school.

Privacy. One-on-one instruction allows the student to explore the curriculum freely without the pressure and potential embarrassment of group instruction.

Mastery of Learning. Students may go over the material as many times as they desire without the time limitations of classroom instruction. After mastering the material, a student can go back at any time for refresher training. This reinforcement provides a strong foundation for continued learning.

Personalized Learning. Training is customized to meet specific student needs, yet students are not tied down to one or two specific subjects. A variety of educational material can be presented in IM, including the basics such as reading and mathematics.

Increased Safety. Many subjects dealing with dangerous materials and procedures can be presented through IM without subjecting the student to unnecessary physical risks. Examples are fighting fires, releasing explosive doors, and dealing with hazardous materials. In academic areas, IM might present the dangers of chemical combustion, or in social areas, the dangers of dealing with drugs.

**Increased Motivation.** Students tend to be better motivated when they interact with the subject material. Along with increased motivation comes enjoyment of the learning process. Learning is no longer a chore because the material is interesting, challenging and entertaining. Students can take control of the learning process and, as a result, discover new areas of interest and continue to learn more.

**Enjoyment of Learning.** Many IM lessons are similar to arcade games which entertain and challenge at the same time. This challenge induces a desire to “win the game”. As a result, the student learns while having fun.

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## Cost Effectiveness of Interactive Multimedia

The IM system is a low-cost, desk top size training device that can be used to teach a wide variety of subjects without direct student-instructor interface.

**Reduced Student Costs.** Training can be accomplished on site, thus eliminating the cost of student travel to training locations.

**Reduced Instructor Costs.** IM is an effective supplement to existing classroom training methods. Fewer instructors are required and their time can be used more efficiently to provide additional remediation for slow learners or motivation for more advanced students.

**Reduced Material Costs.** The initial cost of developing an IM course is high. However, IM replication, distribution and delivery is very cost effective considering the number of students that can be served and the amount of instructional time available through IM. The cost per student decreases as more students use the same material. In traditional instructional methods, the costs lie primarily in the delivery (i.e., teacher salaries, overhead) and remain constant or even increase as more students place greater demands on fixed resources.

**Reduced Safety Hazard Costs.** Training in a hazardous environment requires special safety equipment, additional instructors, vehicles, and equipment. Conducting the initial training using IM can substantially reduce safety risks, training accidents, and time lost due to injury. Students train in a non-threatening environment that is more conducive to learning.

**Reduced Repetitive Training.** Reproduction and updating of training materials is required less frequently and is, therefore, less expensive for recurring training.

**Reduced Equipment Costs.** Obliging vehicles and aircraft for training is very expensive. To keep a large-frame aircraft on the ground for one day can cost as much as \$40,000. Allowing personnel to become familiar with an aircraft before physically going through it can save both time and money. Interactive systems can simulate equipment that would typically be too expensive to make available to students. In addition, for firefighter training, video training includes conserving valuable fuels and firefighting agents.

**Automatic Tracking and Records.** IM systems can incorporate files to track students who have logged onto the system, what materials they have reviewed, how much time they have spent on the material, and what have been the results of their exams. This allows an instructor to conduct automatic surveys of material presented.

**Increased Access.** Multimedia systems can increase access to quality training. The system can deliver peripheral subjects in environments where populations are insufficient to support full time instruction or traveling instructional teams. As more IM titles become available, students can choose from a wider variety of material.

In addition to its benefits, multimedia is receiving positive results and feedback from students and instructors. Below are a few responses from validation reports on courses fielded:

- Students indicated that they felt the multimedia was very applicable to their needs and, like the instructors, felt it could be used to replace some existing instructional strategies.
- Students and instructors indicated that multimedia had a significant role in providing an integrated atmosphere in which students could observe the actions in video and identify proper procedures or errors.
- Students are getting a closer and more in-depth review of material and are receiving training on some subjects that were previously not available.
- Instructors have stated that previously it took up to a year to become fully familiar with a large aircraft, but it now takes only 6 months of training because of the information available through multimedia.

## Aircraft Familiarization training Courseware

Practical on-the-job training is extremely important. However, because it is expensive and time consuming, it inhibits the opportunity for the in-depth discussion and expanded tuition only classroom or computer-based training can provide. In addition, factors such as availability of personnel and aircraft can cause difficulty in meeting training requirements. In response to firefighter training needs, a series of aircraft familiarization training programs has been developed.

The courseware supplements existing hands-on aircraft training by familiarizing the firefighter with aircraft features, entry procedures, shutdown procedures, aircraft hazards, and on-board extinguishing systems. The programs are designed for both the experienced and novice firefighters. Each aircraft training program incorporates full motion video, audio, and high resolution graphics to stimulate the student's mind. Each student can go through the aircraft program as many times as desired. The only skill needed to operate the course is the ability to use the mouse input device. Knowledge of a computer is not necessary.

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## Beginning the Course

All courses are menu driven. Once the system is turned on, the screen displays a menu of topics for the student to select. The student will make most choices from a list of topics presented in a menu format that is typical of computer based training programs. The student may choose randomly from a list of topics or to zoom in on various areas of the aircraft covered in the course.

Menus give the student a great deal of flexibility in choosing the order to view information, and in deciding how the information will be grouped. As a student completes an item, a checkmark will indicate blocks that have been completed. Figures 2. and 3. are menus from the 747 Aircraft Course.



*Figure 2. 747 Main Menu*



*Figure 3. 747 Familiarization Menu*

### Course Layout

All courses are divided into modules, each one dealing with a critical area of an aircraft. Topics can be selected randomly using the mouse input device. Once a module is selected, the course branches to a sub-menu. From there, a series of screens incorporating motion video, graphics, audio, still images, and text delivers the course content. Mouse-activated control buttons on the screen allow the student to move quickly from screen to screen or from menu to menu. Figure 4. shows the main topics covered in the F/A-18 course.





Figure 4. F/A-18 Main Menu

## Course Content

The course is broken down into modules, allowing the student to move freely from subject to subject. A typical aircraft familiarization course is outlined below:

### **Aircraft Orientation**

- Overview
- Exterior Off-Rescue Side & Rescue Side
- Top View & Bottom View
- Interior Flight Deck, Passenger Compartment
- Interior Cargo Area

### **Entry and Exit Procedures**

- Normal & Emergency Entry
- Escape and Exit

### **Shutdown Procedures**

- Cockpit Safety
- Engine, APU, and Oxygen Shutdown

### **Aircraft Hazards**

- Danger Areas
- Cargo, Weapons
- Fuel
- Oxygen
- Batteries

### **On-Board Extinguishing Systems**

- Activation Procedures
- T-Handles
- Nitrogen FSS
- Halon 1301
- Exercises

## Aircraft Orientation

The Aircraft Orientation Module is the “get to know the airplane” section. The aircraft’s dimensions and its role in the fleet are featured in this module. The student can “walk around” the aircraft and locate features such as entry controls, APU exhausts, doors, hatches, and cut-in points. The student can learn about the various configurations, and become familiar with all the general aircraft features.

Figure 5. shows a navigation screen from the C-17 self-guided tour.





*Figure 5. C-17 Self-Guided Tour.*

## Exit Procedures

Exit procedures are demonstrated through the use of motion video. Figure 6. shows the exit procedures from the main deck of the 747 aircraft.



*Figure 6. Exit Procedures.*

## Entry Procedures

Entry Procedures shows the student the primary and secondary entry points into the aircraft. The student will view the normal, emergency, and cut-in entry procedures, and, where applicable, escape procedures. Figure 7. depicts the menu showing the many options to enter the C-5 Galaxy cargo aircraft.



*Figure 7. C-5 Entry Procedures.*

## Shutdown Procedures

This module presents various shutdown procedures for engines, auxiliary power units, and battery switches and shows step-by-step procedures. It also depicts certain aircraft render-safe procedures necessary to prevent possible injury to aircrew or emergency response personnel. Figure 8. shows one of the steps in safetying the F/A-18 Aircraft.



*Figure 8. F/A-18 Safety Procedure.*

## Aircraft Hazards

This module displays danger areas around the aircraft, including intake, radiation, exhaust, and hot brakes. Additional hazards such as batteries, oxygen, fuel, and weapons configurations for military aircraft are also covered. Figures 9. and 10. show aircraft hazards.



Figure 9. F-16 Aircraft Hazards.



Figure 10. F-16 Weapons Hazards.

## On-Board Extinguishing Systems

Step-by-step operating procedures for any on-board extinguishing systems are covered in this module. These include the multiple systems installed on the C-5 and 747 aircraft. The areas affected by these systems are identified.

### Exercises

An exercise section is included in each module to test student progress. The questions in any particular section apply only to topics covered in that module. Questions are randomly generated from a pool, so it will take a number of passes through an exercise to view all the possible questions. The four types of questions are: (1) Multiple Choice, (2) Identification, (3) Location, and (4) Sequence. These are briefly described as follows.

**Multiple Choice:** A question is presented on the screen. The student must select one of three multiple choice answers.

**Identification:** A picture or graphic appears on the screen. The student must identify it from three possible answers.

**Location:** An image appears in the upper portion of the screen. The student must locate a certain item within the image. To do this the student moves the cursor to the correct location and clicks the mouse button.

**Sequence:** A video sequence will start and then pause at the first step of the sequence. The student will be asked to identify the first step from three choices. Figure 11. depicts a sequencing question on how to open a main deck door from the 747 aircraft.



Figure 11. 747 Door Opening Sequence Question.

## Success Story

A B-1B aircraft is scheduled to land at Mildenhall AB, England, from Dyess Air Force Base, Texas. The wings are swept back to save on fuel, but something goes wrong. The pilot declares an in-flight emergency. The runway at Mildenhall is too short to handle a B-1B high speed landing. The aircraft must be diverted to the longest runway in Europe - Frankfurt International Airport in Germany. It is an unfamiliar aircraft coming in at 278 knots (over twice the speed of a normal landing) on 12,500 feet of runway. What could be done to prepare for this real-world incident?

One way is to have on-demand training using interactive multimedia training technology. Fortunately, Rhein Mein, a U.S. Air Base co-located at Frankfurt IAP, had the B-1B Interactive Multimedia Aircraft Familiarization Training Courseware. The fire department reviewed the courseware on the B-1B while the aircraft was enroute. They had two hours to go through all the rescue, shutdown, and emergency tactics to prepare for the landing. Thanks to the IM system and courseware, when the aircraft landed, the personnel had a high degree of knowledge and confidence to respond to the unfamiliar aircraft. As a result, the firefighters responded quickly and decisively, protecting over \$288 million dollars of assets at risk.

Figure 11. Aircraft On Fire.

Figure 13. Firefighters Save Aircraft.

## Conclusions

The challenge of providing high quality, low cost education and training for today's work force is substantial and growing causing educators and trainers to seek new approaches in instructional technology. Interactive courseware technology is one of the key technologies to meet this challenge. As a result, interactive courseware instruction is prominent among the new approaches pursued by educators and trainers.

## Summary

More and more, agencies are seeking training methods in which human intervention is limited. Because of cutbacks, many are looking to multimedia training as the answer. It is certainly becoming a proven tool and is taking its place in the area of education and training where procedural tasks, safety, and other restrictions are limiting other types of training activities. Multimedia answers many training problems and is an attractive option to management responsible for providing proper training. It provides alternative and supplemental options to address the complicated and expensive problem of emergency response training.

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**AIR FORCE SERVICES FOR EXCEPTIONAL CHILDREN (AFSEC)  
NATURAL WORKING GROUP  
SCHOOL-AGE EVALUATION COMPLETION  
REVISION PROCESS**

Mrs. Billie Sue Durden

Capt (Dr) Jennifer Markley

Captain (Dr) Jennifer Markley currently serves as Chief of Pediatrics, Air Force Services for Exceptional Children (AFSEC) at Spangdahlem Air Base, Germany. She has served as AFSEC Quality Monitor for one year. Captain Markley received her Medical Degree from George Washington University and completed her Pediatric residency training at David Grant Medical Center, Travis AFB, CA. She was Pediatric Chief resident for one year and received additional training in Developmental Pediatrics.

Mrs. Billie Sue Durden is currently assigned as Assistant Administrator for the Air Force Services for Exceptional Children (AFSEC) program at the 52 Medical Operations Squadron, Spangdahlem Air Base, Germany. She also serves as the Civilian Representative on the 52 Medical Group Quality Council. Mrs. Durden is currently pursuing a Bachelor's Degree in Business Management with the University of Maryland and will graduate in May 1998.

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# **AIR FORCE SERVICES FOR EXCEPTIONAL CHILDREN (AFSEC) NATURAL WORKING GROUP SCHOOL-AGE EVALUATION COMPLETION REVISION PROCESS**

**Capt (Dr) Jennifer Markley and Mrs. Billie Sue Durden  
Spangdahlem Air Base, Germany**

## **Abstract**

Our mission at AFSEC is to provide multidisciplinary team evaluations and medically related services for children with special needs. Medically related services include such services as counseling, occupational and physical therapy. The school is responsible for providing services such as speech and educational services. We work in close cooperation with the Department of Defense Dependent Schools (DoDDS) to provide these services. The evaluation process can be cumbersome due to the numerous laws and regulations. As a team, we reviewed our evaluation process from start to finish and identified some ways we could improve it. Congressionally-mandated public law states that the evaluations must be completed within a 45 school day time frame. We found that most of our evaluations were completed within a 30-45 day period of time. However, students cannot receive services until these reports are complete and returned to the school. Thus, as a result of both legal and ethical concerns, we felt the evaluation process should be completed in a shorter period of time; our goal was set at 30 days or less. This paper describes the steps used to come to our conclusions and the improvements we initiated in order to establish what we considered a best practice with respect to assessments.

## **Introduction**

Air Force Services for Exceptional Children (AFSEC) is a multidisciplinary team of 11 medical providers in nine different specialties that provide comprehensive medically-related evaluation and treatment for children with special educational needs, ages birth to 21 years of age. Medically related services include such services as counseling for emotionally impaired children and occupational and physical therapy for physically impaired children. The school is responsible for providing services such as speech services for the communication impaired and educational services for the cognitively and learning impaired children. Mandated by Public Law 1342.12, Provision of Early Intervention and Special Education Services to Eligible Department of Defense (DoD) Dependents in Overseas Areas, the AFSEC team is required to complete evaluations on children, ages 3-21 years, within 45 school days after parents sign a permission to assess. In the continental United States, this responsibility is a state-wide responsibility and, therefore, the individual state is responsible for providing this service. In the unique overseas arena, each major command is treated as a "state" and the military medical facilities must provide these services for DoDDS.

Public Law 1342.12 mandates that a child must be assessed in all areas of suspected disability. In order to begin providing medically-related services (MRS) to children who qualify for special education services in the school, the evaluation must be completed and the school must perform several meetings and complete an Individualized Education Plan (IEP) for the child. Due



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to the complicated nature of performing as many as six different individual evaluations on a child, the time-to-completion often runs very close to the 45 day deadline. A child cannot receive MRS until the assessment is complete, an eligibility meeting is held at the school and a service delivery plan developed. In an effort to shorten this timeline, so that MRS provision can begin as quickly as possible, our team concurred that the current assessment process needed to be reviewed to determine whether there was a way to complete the required evaluations in a shorter timeframe.

### **Stage One: Find A Process to Improve**

In an effort to determine what areas within AFSEC the team felt needed improvement, our team conducted a brainstorming session and generated a list of potential areas to improve upon. Afterwards, a survey was distributed to each team member with all of the ideas listed on it and team members were asked to rank these suggestions in order of importance to them. The most important process identified was the timeliness of school-age evaluations. The federal timeline has always been met, but it was taking very close to the full 45 days to complete the process. In reviewing the statistics from the current school year (SY96/97), it was taking between 30 - 45 school days to complete 39% of the evaluations. The team set the standard that 100% of the evaluations should be completed in 30 days or less.

### **Stage Two: Organize A Team That Knows the Process**

The entire AFSEC team was involved in the process improvement initiative. It was determined that all of the members of the team needed to be a part of the natural working group in order to effectively improve this process. Therefore, both medical providers and administrative staff would have input into the improvement process.

The team consisted of:

Maj (Dr) Randy Robinette, Neuropsychologist, AFSEC Chairperson

Maj (Dr) David Kutz, Child and Adolescent Psychiatrist

Capt David Ubelhor, Clinical Social Worker

Capt Rose Mary Crayne, Occupational Therapist

Capt Laura Fields, Physical Therapist

Capt Ada Haber-Perez, Audiologist

Capt (Dr) Jennifer Markley, Pediatrician

Capt Beth Harrison, Speech-Language Pathologist

Lt Jim Ronyak, Occupational Therapist

Ms. Teresa Hirst, Community Health Nurse

Ms. Suzanne Iverson, Early Childhood Special Educator

Mrs. Juvy Stallons, Office Automation Clerk

Mrs. Billie Sue Durden, Assistant Administrator.

### **Stage Three: Clarify Current Knowledge of the Process**

The team developed a flow diagram to chart the many faceted evaluation process from start to finish, including the decision points, and the crucial steps. Crucial points in the process included referral information is reviewed by the pediatrician, the case is prestaffed to determine which



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providers/specialties need to evaluate the child, providers conduct their specialty evaluations, the case is discussed by all providers to determine diagnoses and medical/educational recommendations, and a final team report is written and sent to the school.

### **Stage Four: Understand Sources of Variation**

Through a brainstorming session, the team listed the different factors which they believed affected the time to completion. The factors were divided into four different areas: procedural concerns, people concerns, policy concerns, and equipment concerns. There are several factors within each of these four areas that affect the time to completion of the report: For example, procedural difficulties included scheduling patients, timely submission of completed referral packages from the schools, comprehensive evaluations not always being warranted, timely completion of reports from individual providers, providers absent at staffings and a lack of central documentation storage of reports for better access.

### **Stage Five: Select the Process Improvement**

Three particular areas were identified as contributing the most variance for completion of the evaluations. Those areas were: 1) timely submission of individual provider reports for the team report; 2) no easily accessible storage site for evaluation documents; and 3) comprehensive evaluations not always being warranted.

### **Stage 6: Plan the Improvement and the Data Collection**

The first issue, timely submission of individual provider reports for the team report, was discussed at length. The major complaints were that it was difficult for each provider to accomplish evaluations (that can take up to two hours each), continue to provide services for an existing heavy caseload, and write up lengthy reports. The suggestion was made to remind providers to prioritize the reports, ensuring that reports to be staffed next were the reports that were to be written up first. It was decided that internal incentives might help remind providers that they needed to submit their reports. The team decided to display a checklist in the conference room with each provider's name on it. The focus was on visible accountability and it would be noted at the time of each staffing which provider had not submitted their individual report. A checklist was implemented and data collection began 1 March 1997. Furthermore, a list of cases to be staffed on Friday was distributed to providers on Monday as a reminder to finish their reports.

The second issue of no central document storage system for team reports was already being worked. Historically, the method for putting individual provider reports into the team report was for the provider to write the report and then to transfer it to a floppy disk. The floppy disk would be given to the administrative assistant for compilation into the team report. The administrative assistant was faced with the problem of having to remind providers on a constant basis to turn their reports in so that there was enough time to compile all of the information prior to the case being staffed by the team. At the time of this brainstorming session, Medical Information Systems had been contacted in regards to building a group drive on the LAN for AFSEC. In using this group drive, only AFSEC team members would have access to this drive (thus ensuring confiden-

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tiality), the team reports would be available for all of the team members, and the team members would be able to simply pull the document up and input their individual piece. This system also provided the opportunity for providers to review co-worker's input, therefore decreasing redundancy of information in the report. The group drive has been created and providers have been trained in its use. The metric for this issue was that AFSEC assistant administrator would maintain a log of individual provider reports completed by time of staffing and this data will be tracked by AFSEC administration.

The third issue of providing a more specific as opposed to a comprehensive evaluation created much debate. Due to the complicated nature of performing as many as six different individual evaluations on a child, the time to completion often runs very close to the 45-day deadline. In an effort to shorten this timeline so that MRS provision could begin as quickly as possible, our team concurred that the current policy needed to be reviewed to determine whether there was a way to complete the required evaluations in a shorter timeframe.

All of the AFSEC providers wanted to be certain that an appropriate comprehensive evaluation was conducted. Historically, when a referral was received from a school, the pediatrician would review the referral and then assign all six different specialists to perform an evaluation, regardless of the question from the school about the suspected disability of the student. Inevitably, the occupational therapist or the physical therapist would perform evaluations on a student when the school's question was "Does this child have a psychoemotional impairment that affects his academic/educational performance adversely?" Schools are required to perform hearing and vision screenings prior to submitting a referral package to AFSEC. Many times, the AFSEC audiologist was performing complete hearing evaluations on students with no hearing concerns expressed by the school or parents. Situations similar to these were common and the unwarranted additional evaluations increased the time needed to complete these evaluations. In these circumstances the evaluations were entirely normal. The team determined that the pediatrician should review the referral package and the outpatient medical record to determine which specialists needed to evaluate the child. The pediatrician sees all of the children by law and if, during the initial evaluation, parents voiced concerns regarding their child that were not voiced in the school referral package, those evaluations would then be accomplished. The team felt that if the evaluations were tailored to the actual concerns regarding the child, the complete evaluation could be completed in a shorter amount of time and services for those concerns voiced could begin sooner, as well. This solution was implemented immediately.

## **Stage 7: Do the Improvement and the Data Collection**

Official tracking of the implemented solutions began 1 March 1997. The team decided to complete a six-month tracking period and then to reassess the improvement process at that time.

## **Stage 8: Check the Results of the Implementation**

Official tracking of timely submission of individual provider reports, proper training and utilization of the group drive and comprehensive versus more specific evaluations began on 1 March 1997. Implementation of the group drive was actually accomplished in January 1997 and the providers had begun to utilize it by February 1997 (December 1996 was low due to the fact

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that there are only 10 school days in this month).

### **Stage 9: Act to Hold the Gain and Continue Improvement**

This will be our next step in this process improvement. The plan is to track the data until the end of the 96/97 school year with June being the last month of data. This will constitute four full months of data in which to evaluate our data.

### **Conclusion**

AFSEC's vision and ultimate goal is, as a multidisciplinary team of pediatric specialists, to maximize the potential of all children with special needs, ages birth to 21 years. It is our responsibility to provide the best possible care for these children and their families. Through process improvement initiatives and working as a team, these goals can be reached. Our team feels that, through reducing the time it takes to evaluate a child to determine whether they qualify for special education services, they will increase the quality of life for these children by providing medically-related service/treatment in a more timely manner. Reviewing this evaluation process in a step-by-step process enabled team members to realize the complexity of the process and importance of their participation in it.

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# **Shaping Air Force 21st Century Strategic Priorities: Linking and Integrating the Balanced Scorecard into Air Force Strategic Planning**

**Air Force Center for Quality and Management Innovation,  
Major James D. Quilliam Chief Future Concepts**

## **Abstract**

The Air Force Center for Quality and Management Innovation, (CQMI) is dedicated to shaping tomorrow's Air Force through innovative expert management capabilities to improve mission effectiveness. The infusion of the Balanced Scorecard approach into the current Air Force strategic planning process provides the cornerstone for an integrated strategic management system. It provides a powerful framework for translating organizational vision and strategy into a comprehensive set of performance measures. It also provides a vehicle to communicate the organizational strategic agenda and helps executive leadership and management teams set strategic priorities for the future. This paper describes the Balanced Scorecard approach and criteria, linkage with Air Force Strategic Planning, Balanced Scorecard development phases, development of an Air Force mission driven Balanced Scorecard, examples of Balanced Scorecard objectives and measures and the use of the Balanced Scorecard as a personal Balanced Life System.

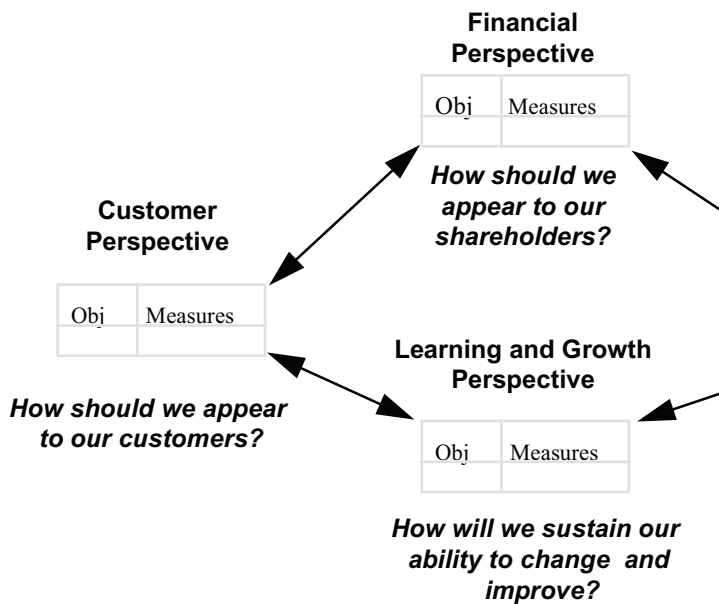
## **Introduction**

The Balanced Scorecard is a concept introduced by Kaplan & Norton in the January-February 1992 *Harvard Business Review*. The Balanced Scorecard is a proven approach to strategic planning that imbeds the long-term strategy into a management system through the mechanism of performance measurement. It is a modern tool to translate vision into action. Kaplan and Norton discuss how the scorecard effectively communicates a strategic purpose that motivates and tracks performance against goals. This means that it clarifies the vision of the future and the performance drivers to move the organization to vision accomplishment. The key result is a sound strategy for Air Force organizations that is translated into a set of action oriented performance measurements. Kaplan and Norton's Balanced Scorecard is shown in Figure 1.

## **Balanced Scorecard Approach-Overview**

In order to put the Balanced Scorecard approach into perspective, it is important to examine the critical linkage of vision with strategy. The vision typically describes the ultimate goal of the organization. A strategy on the other hand is a mutually shared understanding on how developed goals are to be reached. The premise then of the Balanced Scorecard approach is what you measure becomes what is important and this is what motivates behavior. The problem with traditional measurement systems is that they are financially focused and do not direct the organization toward future success. Financial measures reflect past decisions and motivate short term behavior at the expense of long term strategy. The conclusion for the entire system is that measurement must be linked to strategy. The Balanced Scorecard solidifies the organizational focus by setting objectives and measuring performance from four distinct perspectives: financial, internal, learning and growth, and customer.

**Figure 1. Kaplan & Norton's Balanced Scorecard**



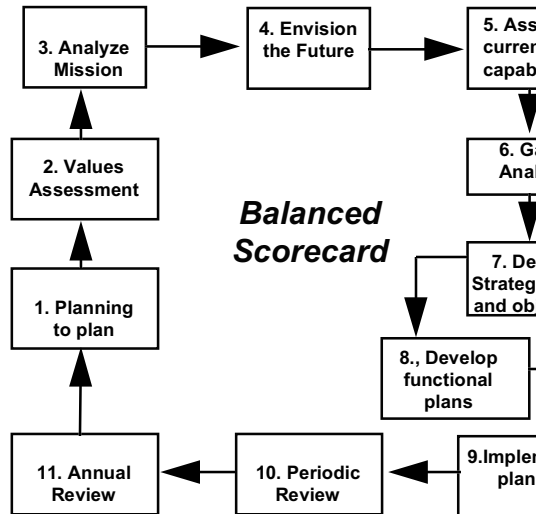
## Balanced Scorecard Criteria

The key aspect of the Balanced Scorecard is that it tells the story of your business strategy. Three important criteria are: Cause and effect relationships, performance drivers and linkage to financials. In the cause and effect relationships every objective that is selected should be linked to the strategy. Measures that are common for most companies are usually called “Lag indicators.” Examples of lag indicators are market share or customer retention measures. The true drivers of performance are called “lead indicators” which represent what is different about strategy. Examples of lead indicators are revenue mix or product development cycle. Another important factor is that every measure that is selected should be related to the financial results of the organization.

## Balanced Scorecard and Strategic Planning

Figure 2 outlines the Air Force Strategic Planning model represented by 11 strategic planning elements. The Balanced Scorecard methodology is an effective model for the strategic thinking process. The organization analyzes three important Air Force strategic planning elements. Specifically, assessing current capabilities, gap analysis, and development of strategic goals and objectives. In the assessment phase, the organization assesses the gaps between current organizational performance and the organizational espoused vision. These gaps are considered relative to the respective scorecard perspectives. Based on the results of the gap analysis, the organization develops strategic goals and objectives as part of the strategic plan within the context of the four scorecard perspectives. Before developing strategic goals and objectives as part of the scorecard, the organization should have developed a basic business strategy for attaining the vision. This basic business strategy serves as the grand linking strategy between the goals and objectives.

**Figure 2. AF Strategic Planning Mode**



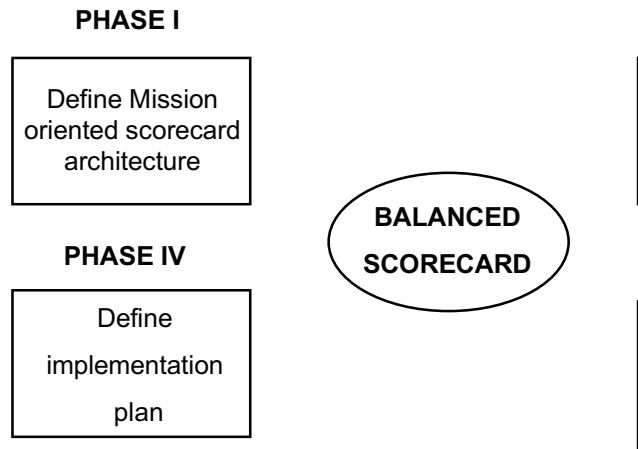
The importance of the Balanced Scorecard in the Air Force strategic planning process is that it can provide the means to begin addressing measurements of outcomes. The Balanced Scorecard provides the organizations with a system view with system-level measures that reflect organizational performance. This links strategy and performance measurements so that the measures continually tell the story of the organizational strategy. This means that a balance between outcome measures and measures of key performance drivers should be established so that a commensurate mix of lag and lead indicators are formulated. The Balanced Scorecard offers an effective framework to address those critical elements of strategic planning such as assessment, gap analysis, and strategy development. This allows for consideration of the gaps between present and future (vision) relative to scorecard perspectives. Development of goals and objectives will be based on results of the scorecard gap analysis. The Balanced Scorecard guides an organization to evaluate their current financial performance (fiscal obligations and responsibility); in terms of internal business processes, in reference to the ability for innovation, learning and growth, and in reference to customer expectations.

### **Balanced Scorecard Development Phases**

The development of a Balanced Scorecard is a four phased approach as depicted in Figure 3. If executed properly this four-phase process will encourage commitment to the scorecard among senior and mid-level leaders and produce a good Balanced Scorecard to help these leaders achieve program objectives. Phase I defines the scorecard architecture, Phase II defines the strategic objectives, Phase III defines the strategic measures that relate to the objectives determined in Phase II, and Phase IV defines the steps for an implementation plan.



**Figure 3. Development of a Balanced Scorecard (fo**



## Define Scorecard Architecture

The objective of defining the scorecard architecture is to develop a deeper understanding of the organization and to construct a targeted framework that reflects the distinct aspects of the organizational strategy. It is also important to define the organizational unit for which a top level scorecard is appropriate. The initial scorecard process works best in a strategic business unit that conducts activities across an entire value chain represented by operations, marketing, sales, and service. Typically in a for-profit organization the financial objectives drive organizational strategy. In government and more specifically Air Force, environments, mission rather than financial objectives drives organizational strategy: Striving for mission accomplishment and improving operational performance is the ultimate outcome. Financial objectives represent only a segment of mission accomplishment. It is imperative to formulate a mission perspective that is congruent with the vision before asking specific questions about each Balanced Scorecard perspective.

Once the mission perspective is formulated, the following are some examples of questions to ask the organization when determining internal perspectives. *Financial*: How are financial contributors & fiscal obligations satisfied? *Internal*: What are the internal core processes? How are the operating characteristics of time, cost, and quality assessed? *Learning*: What are specific enablers for each core process (Learning and growth objectives to support the strategy)? *Customer*: Who are the customers and what are their expectations? From these questions a basis for the scorecard is developed.

## Define Strategic Objectives

The primary purpose in defining strategic objectives is to develop scorecard objectives based on input from members of the organization. The first step in this phase is to prepare background material on the Balanced Scorecard as well as pertinent internal documents. Once senior leaders have had a chance to review this information, personal interviews are conducted with each senior leader. The interview results are then shared with the group in a synthesis session. The output of this synthesis session

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should be a ranking of the objectives in the four perspectives. A meeting is then held with the senior team to gain consensus on the scorecard. The group discusses the mission and strategy statement then asks the critical question “If we succeed in our vision and strategy, how will performance differ for each of the four perspectives?” This is where consensus is built around strategic objectives and the top 3-4 critical objectives are determined for each scorecard perspective. The results of the workshop should provide for 3-4 strategic objectives for each perspective, a detailed description statement for each objective, and a list of potential measures for each objective.

## **Define Strategic Measures**

The objective of this third phase of the process is to develop scorecard measures that track the achievement of objectives. The essential outcome in selecting specific measures for a scorecard is to identify the measures that best communicate the meaning of the strategy. Every scorecard is unique and therefore should contain several unique measures. It is important to have these four outputs from this phase: A list of objectives accompanied by a description of each objective, a description of each measure, an illustration on how each measure can be qualified and displayed, and a graphic model of how measures are linked within the perspective and to measures or objectives in other perspectives. This is the phase where validation of the strategy takes place.

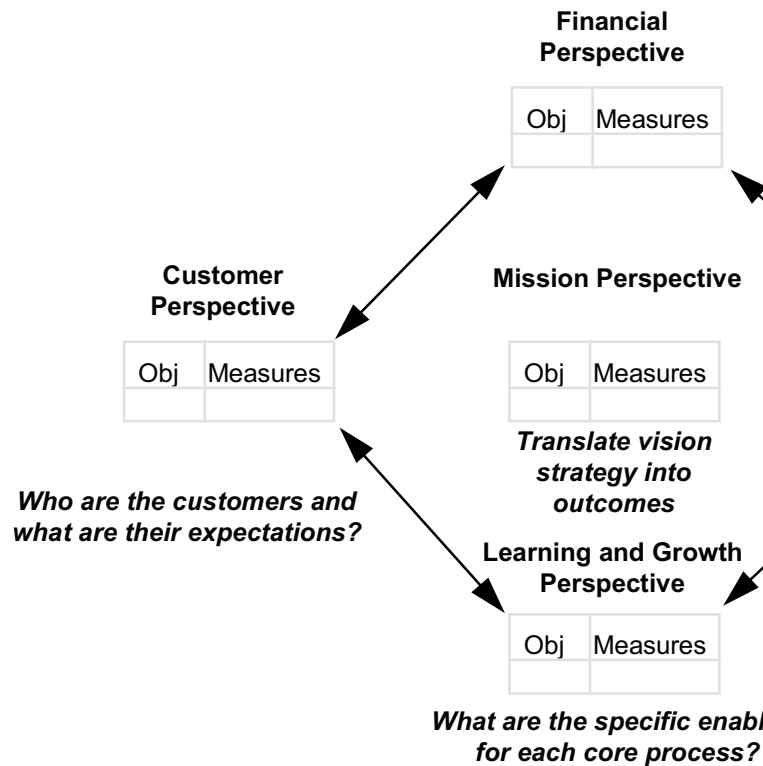
## **Develop the Implementation plan**

Upon translation of the vision and clarification of the direction of the organization, the implementation plan shows how the measures are to be linked to the Air Force data base and information system, and how the plan will be communicated throughout the organization to encourage and facilitate the development of performance measures. The plan is linked to all departments so that they can develop scorecards for their units integrated by themes. Examples of areas of integration into the management system are human resources, financial management, information management and strategic planning. The implementation then mobilizes the organization to integrate the strategy and rollout to members of the organization for strategic change. The recommended timeframe for the scorecard to create value and to be integrated into the organizational management system is 60 days. A typical scorecard rollout project can last up to 16 weeks. This provides the team with valuable time to evaluate and analyze the evolving structure since it will become the cornerstone of the management system. Now that we have reviewed in detail the phases of the development of the scorecard let's examine the development of an Air Force Mission-Driven Balanced Scorecard.

## **Development of an Air Force Mission-Driven Balanced Scorecard**

The diagram in Figure 4 provides a visual perspective and explains the key areas in a mission oriented strategy. The development of a mission oriented scorecard begins with envisioning the future to identify the basic strategy the organization will follow to reach its future desires. The organization then translates its vision into specific outcomes it must create to realize that vision. These specific outcomes become the mission perspective. The mission perspective indicates the external results that must be achieved to meet the vision. The remaining four perspectives (financial, internal, learning and growth, and customer) serve as the internal performance drivers that lead to completion of the external outcomes.

**Figure 4. Development of a Mission**



## Balanced Scorecard Examples

Figure 5 provides examples of objectives and measures associated with the four Balanced Scorecard perspectives. These examples provide a snapshot of the key Air Force Mission-Driven Balanced Scorecard objectives and their associated measures that indicate the overall well being of the organization as it relates to vision attainment.

➤ **Figure 5. Balanced Scorecard**

<b>Financial</b>	Objectives	
	1. Reduce cost structure 2. Improve Returns	1. Percent of 2. Return on
<b>Internal</b>	Objectives	
	1. Evaluate products 2. Minimize operational problems	1. # of new p 2. Service er
<b>Learning</b>	Objectives	
	1. Develop individuals 2. Encourage employee ownership & recognition	1. Training of 2. Employee recognized fo
<b>Customer</b>	Objectives	
	1. Customer satisfaction 2. Increase satisfaction "after the sale"	1. Customer 2. Customer

## Balanced Scorecard as a Personal Balanced Life System

➤ **Figure 6. Balanced Life Sy**

<b>Family</b>	Objective	
	Spend quality time with family	Friday nite and Wednesday d
<b>Spiritual</b>	Objective	
	Increase volunteer charity work	Children hospi
<b>Professional</b>	Objective	
	Enhance supervisory skills	Supervisory tra meet ings with
<b>Physical</b>	Objective	
	Implement workout program	3 -50 minute w

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Figure 6 takes the Balanced Scorecard beyond business implementation and moves it into the personal arena. The organizational member identifies the key perspectives that are critical for establishing a personal balanced framework. Associated objectives and target measures are designed and then discussed with other team members. The intent is for the balanced life system to complement the organizational Balanced Scorecard objectives. This helps establish a balanced approach to life's priorities while insuring a linkage with organizational objectives. The scorecard can also be used to empower individuals to set or participate in setting their own goals, and identifying their importance and worth in connection with the overall organizational direction. This approach can be used in place of the traditional "Management by Objective."

## Conclusion

Organizations that have been using the Balanced Scorecard and that have successfully integrated this tool into their management processes are beginning to see significant financial and operational results. The intangible benefits are that the organization understands the drivers of business success and it also becomes an educational learning process for the organization. If done correctly the Balanced Scorecard approach allows organizations, for the first time to consider all the relevant strategic factors in one basic model. For Air Force organizations, the Balanced Scorecard can drive dramatic improvements in mission performance. This will allow organizations to direct their focus on what is truly important while freeing energies and resources to insure a successful Air Force for the 21st century and beyond.

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# THE EIGHT-STEP STREAMLINED PROCESS FOR SOLE SOURCE ACQUISITIONS

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**BY: TAMELA G. SHEMA**

*WR-ALC/PK(3)*

## ABSTRACT

The Eight-Step Streamlined Process for Sole Source Acquisitions developed by an Integrated Product Team (IPT) from the Specialized Management Directorate, Warner Robins Air Logistics Center, Robins AFB Georgia, has made benchmark improvements in the process for acquiring supplies and services in the noncompetitive environment. The streamlined process can be applied to any sole source acquisition. This method compares with doing business as usual including extensive time to issue government solicitations, proposal development and evaluation, fact finding, and negotiation.

Some key facets in the success of the Eight-Step process are: (1) A joint government/contractor process from the beginning of acquisition planning. (2) Early and extensive user/customer involvement. (3) On-line electronic communications and shared databases that facilitate team building and reduce/eliminate Contract Data Requirements Lists (CDRLs). (4) Mutual trust and open communication breed teamwork. (5) Government and contractor processes are continually reviewed in a team environment. "Out of the box" thinking becomes the norm. (6) Early involvement of senior government and contractor management fosters positive feedback so direction of the acquisition is much easier. (7) The joint process keeps focus on the customer's minimum requirements.

Significant reductions in time and cost of the acquisition process are direct customer benefit. Acquisition cycle times have been reduced from an average of 120 days to 30 - 50 days. Direct cost savings well in excess of a million dollars have been generated with life cycle cost savings in the tens of millions of dollars. Indirect benefits include a vastly improved long-term relationship between the contractor and the government.

## THE EIGHT-STEP STREAMLINED PROCESS FOR SOLE SOURCE ACQUISITIONS

### HOW THE EMPOWERED TEAM IMPROVED SERVICE TO OUR CUSTOMERS:

There had long been a need for a benchmark in sole source sustainment. When the Assistant Secretary of the Air Force (Acquisition) (SAF/AQ) established the Air Force Acquisition Lightning Bolt Initiatives, the Air Force Program Executive Officer (AFPEO), senior leaders from the System Program Office and the System Support Sustainment Office at WR-ALC/QL, Specialized Management Directorate, met and decided the organizations' Multi-Product Contractor Depot effort was an excellent candidate for acquisition streamlining. The Acquisition Lightning Bolt Initiatives were developed by the office of the Principal Deputy Assistant Secretary for Acquisition and Management



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for the Air Force. The purpose of the Lightning Bolt Initiatives was to identify specific areas within the acquisition process targeted for significant improvement. This mandate for change required a fundamental shift in the way the Air Force conducts acquisition.

Simultaneously, we recognized most acquisition streamlining initiatives implemented to date, such as those associated with source selection, had focused on processes within the competitive environment. The team saw significant opportunities for process improvement and developed a dynamic process model which provides a comprehensive framework for sole source acquisitions.

The old process of conducting sole source acquisitions includes government requirements determination and development of an extensive solicitation. The government requirements must then be interpreted by the contractor in their attempt to develop a proposal responsive to the solicitation issued by the government. Usually, a fact-finding session regarding the contractor's proposal is required. At that time, misunderstandings of the requirement are surfaced and extensive rework of the proposal may be necessary. After a subsequent proposal submittal, field and technical reports are required. Based on the best information provided by these reports, a negotiation position is developed and negotiations with the contractor ensue. This method of "doing business as usual" is extremely time consuming and often leads to misunderstanding of requirements and extensive rework necessitated by numerous clarifications on the part of both the government and contractor.

The joint government/industry team was empowered by SAF/AQ, the AFPEO, the Director of Contracting (WR-ALC/PK), the System Program Director (SPD), the Director of the Specialized Management Directorate (WR-ALC/QL), the System Support Manager (SSM), and senior contractor officials. The team was empowered by these senior leaders to "think out of the box" in planning and developing an innovative approach to sole source sustainment.

The team benchmarked numerous successful government and contractor efforts, jointly brainstormed new ideas and concepts with the contractor, and performed an intensely detailed analysis of management, technical, and support processes, to facilitate understanding and define detailed performance tasks. The acquisition process was then streamlined into the Eight-Step process.

The Eight-Step process includes all aspects of the entire acquisition process. The team determined that the acquisition process included all activities from the time the user defined their total requirement until the time a contract is awarded to the contractor. It was determined by the team that all aspects of the acquisition process must be available to all pertinent parties to the acquisition. At each step of the acquisition process, the team must determine who should be involved with the process. The user, finance community, government, and contractor must be a part of the appropriate steps. The team should decide at each step who must participate in order to get the desired results of the step. The distinct steps defined by the team are:

Step 1 - Identify Preliminary Requirements - This is an opportunity for the government and contractor to understand the top-level requirements of the government. At this step, the government and contractor each develop their independent estimates, including assumptions, based on the requirements of the user.

Step 2 - Risk/Budget Reconciliation - This step allows the government and contractor to evaluate their estimates compared to the requirements and make risk assessments or trade-offs which may affect the indi-

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vidual estimates. The estimates are used at this step only as a measure of understanding about the user's requirements.

Step 3 - Acquisition Strategy Development - The government and contractor jointly develop the strategy for the acquisition. The government team includes the appropriate administration team members. The Justification and Approval and Single Acquisition Management Plan are developed, if appropriate, by the entire team. If there is a need for an Acquisition Strategy Panel the briefing is given to both the government and contractor management by the joint team.

Step 4 - Issuance of a Letter of Solicitation - A letter of solicitation is issued in lieu of an extensive document developed by the government. This letter of solicitation provides information the contractor has already been involved in developing and it initiates actions to begin the joint development and pricing of the acquisition.

Step 5 - Contract Development - A team of experts from the government and contractor is assembled to define the actual work to be performed to meet the user's requirements. The team will consist of appropriate disciplines for the acquisition. The teams may include engineers, material managers, quality experts, manufacturing managers, and program managers. The teams are determined by the individual acquisition. At this step, the individual teams define the tasks which will be required to perform the work and develop the top-level schedule for performance.

Step 6 - Task Definition and Pricing - The pricing is performed at this step by the individual teams. There is no separate contractor proposal. The pricing is performed by the joint teams. The price is developed to ensure that all tasks defined are fully justified and all supporting documentation is provided.

Step 7 - Contract Documentation - This step involves gathering all data generated by the teams and developing the final contractual document. A Joint Pricing Document (JPD) is developed which takes the place of a contractor's proposal, field technical and audit reports, and the traditional price negotiation memorandum. The JPD is signed by all parties who participated in the acquisition. The government and contractor contracting officers, program managers, and the Administrative Contracting Officer, as appropriate.

Step 8 - Contract Award - This step involves the contract file review and signing the contract by the government and contractor.

Some key facets in the success of the Eight-Step process are: (1) A joint government/contractor process from the beginning of acquisition planning. (2) Early and extensive user/customer involvement. The customer was a key player in the team's decisions and actions. In developing the Multi-Product Contractor Depot, the sustainment requirements of the customer were discussed in detail, and all customers were involved in process development. (3) On-line electronic communications and shared databases, while not a mandatory requirement for successful use of the process, accelerate time savings while access to mutual real-time shared databases facilitate team building and reduce/eliminate CDRLs. (4) Mutual trust and open communication breed teamwork. Conflicts are resolved early, before positions harden. (5) Government and contractor processes are continually reviewed in a team environment. "Out of the box" thinking becomes the norm. (6) Early involve-

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ment of senior government and contractor management fosters mutual trust and open communication. Positive feedback is achieved and overall direction of the acquisition is much easier. (7) The joint process keeps all parties focused on the customer's minimum requirements with minimal conflict and miscommunication. Joint execution of the acquisition process greatly reduces both time and the number of documents exchanged for serial review and revision until final contract signature is accomplished.

**APPLICATION OF THE EIGHT-STEP PROCESS HAS RESULTED IN DRAMATIC REDUCTIONS IN ACQUISITION LEAD TIMES AND SIGNIFICANT COST SAVINGS WHILE INCREASING PRODUCT QUALITY TO OUR CUSTOMERS, RESULTING IN AN ACQUISITION THAT TRULY IS "BETTER, FASTER, AND CHEAPER".**

Reduction in acquisition cycle time was a primary objective of the streamlined process. Application of the streamlined process has resulted in cycle time reductions in excess of 60%. These cycle time reductions apply to the administrative lead time, or the period of time from receipt of the requirement by the contracting organization, to award the contract. In addition, production lead time has been reduced. Due to the contractor's greater understanding of the requirement and his involvement with the acquisition detail, his proposed schedules have been reduced an average of 60 days. This reduction has been achieved because the contractor is no longer required to evaluate the results of the final negotiation and develop his contract strategy and schedule. The joint IPT determines the top level schedule and overall strategy as part of the requirement development. The contractor and government contract administration team "hit the ground running" at contract award, meaning no lag time for the personnel to learn their responsibilities under the contract through long, complicated post-award conferences. Fewer contract modifications have been required during post-award due to greatly increased understanding of the requirement and improved communications during the pre-award process.

Cost savings have been realized as a result of the streamlined efforts. Life cycle cost savings are estimated to be in the millions of dollars. As this method of acquisition is relatively new, the long term success has not yet been fully measured. However, individual cost savings have been realized in various acquisitions. A software upgrade effort identified areas within the scope, involving contractor staffing, which would have previously been undetected, saving over \$250K. The software team had insight into the contractors proposed staffing and productivity factors used by the contractor which would have not been available in a traditional proposal submittal and evaluation. The joint team was able to challenge the method of staffing proposed by the contractor management and achieved improvement in the level of expertise which will be utilized to perform this effort, thereby achieving the savings.

A production effort for a key component of our system was placed on contract with savings exceeding \$3M. The contractor was able to make key subcontracting decisions earlier because the joint technical team provided detailed technical information far earlier than the traditional method of negotiation would allow. Additionally, the team was able to perform detailed risk analysis that allowed appropriate trade-offs to be made, resulting in significant cost savings. A single initiative to change requirements to a vendor resulted in savings in excess of \$750K. The additional savings came from the risks evaluated by the team which included schedule, technical, and cost risks. The team was able to make decisions about potential vendors and efforts which could be used to qualify new vendors. The decisions made by the team and recommended for the acquisition resulted in additional savings to this effort reducing the estimate of the acquisition in time and money. The effort was originally proposed to be a basic contract with three options. Due to innovative efforts pro-

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posed by the joint team to improve parts availability and qualification of new vendors the acquisition was changed to include only two options. This was possible due to the total savings in the acquisition because the jointly developed price, which is a result of the IPT process, represents much more extensive knowledge of the product and a more thorough analysis of the savings which can be realized due to more knowledge of the comprehensive system.

Innovative methods of doing business smarter have also been a part of the streamlined process. The acquisition of repair to support various programs includes flexibility within the contract structure and also allows the contractor the flexibility to continually improve his internal processes and procedures. Changes to the way we had done business previously included changing the method of funding the repair contract. The financial community agreed that all known requirements could be funded at the beginning of the fiscal year, thereby eliminating the need to issue individual repair orders as requirements generated. This flexibility within the contract improves lead time and cycle time as well as reduces the contractors support labor costs. The known quantities were defined in terms of known support costs and the point at which all required nonrecurring costs would be incurred. The assets that generate after all known nonrecurring costs have been paid are input at a lower price to the government which include only the necessary touch labor and material costs, thereby reducing the costs of the repairs.

The joint team achieved even greater process improvements on a Depot Development contract. These improvements were made by incentivizing the entire government/contractor team to propose new ways of enhancing the productivity of the contractor depot. This could only be accomplished by an empowered IPT with the ability to understand current processes and procedures and take actions necessary to eliminate redundancy, evaluate suggestions for improvements, and propose actions which save the government and contractor time and money. The incentive to the government team was to include as many process changes and improvements as possible in the contract. This was achieved by evaluating current contractor processes and recommending improvements. These improvements were evaluated by the contractor and many of them were accepted and incorporated into the joint task/price development. By saving schedule and money, the team was able to accomplish more tasks than originally anticipated. Incentives developed under the contract provided the contractor with the initiative necessary to make significant improvements to the overall depot. The incentive to the government team members came by way of saving schedule and accelerating the original completion date. It also saved money that allowed the inclusion of tasks which were previously apart from the available funding profile.

The relationship between the government and the contractor has vastly improved. An environment of mistrust and conflict has been replaced with a team-based, win-win attitude emphasizing open communication and mutual trust. This relationship has extended beyond just the buying agency to include the user and the contract administration community. Because working level personnel are now involved with the development of the requirement and they understand the total scope of work to be performed, they have more responsibility to the requirement. They no longer see their roles as enforcer and strict task managers. They understand the work to be performed and they work together to achieve the defined scope. There is more pride in the contract and neither party feels that they are working within the bounds of a document created by people who do not understand the needs of the program. The working level personnel are involved with the scope definition and its overall execution.

This relationship of enhanced communication has been fostered by the new approach to requirements development and pricing. A lengthy Request for Proposal (RFP) is no longer issued which requires the contractor to interpret the government's requirements. Additionally, there is no tradi-

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tional contractor proposal. Teams develop detailed cost estimates with greater in-depth analysis of cost databases than previously, greatly reducing the need for post-award audits and reducing chances for defective pricing to occur. A “win/win” schedule and total cost agreement are reached on the item or service required. There are no more different interpretations of cost based on a “bottom-line” negotiated price. This process can be effective if all parties maintain an attitude of respect and professionalism. The streamlined process requires a commitment from top management of the resources required to perform each step. The team members must understand the complete requirement and be willing to work with their counterparts to develop the best product for their customer. Personalities must be such that there is a pride in the product to be produced. This process allows pride in workmanship throughout the steps. No single team member can be successful without the support of the entire team.

This new way of doing business has evolved due to the emphasis to re-invent government. The charter given to this team at its inception was to find ways to do business smarter, faster, and cheaper within the existing regulations. The only limitation given was to stay within laws and statutory requirements. All policies, regulations, and old ways of doing business were challenged and changed if they did not foster the best way of doing business. The team developed their process based upon meeting the intent of all regulations. However, just because things had “always been done that way” in the past was not necessarily the only way the task could be accomplished. The team assessed the old way of doing business and made recommendations of how the work could be done better or faster. There are checks and balances inherent in this streamlined process. This way of doing business is based upon a discipline provided to all team members at the beginning of the process. The method of implementation requires that certain tasks be accomplished and training all members of the teams is a key element to the success of this process. The contractor is not relieved of any requirements of the Truth in Negotiations Act (TINA). Therefore, all documentation necessary to meet the TINA requirements is defined to the teams at the beginning of the process and it is gathered at the end of the process. This step is still required but the type of documentation provided may be different from the way it has always been provided previously. Electronic documentation is utilized to the greatest extent possible.

The development of the teams is an important step to this process. Once the individuals are identified who will be part of the team, their roles and responsibilities must be clearly defined. Teams may not happen naturally and providing them with guidelines and requirements is important to achieving the ultimate goal. That goal is a complete requirements definition and schedule that the team can work within to achieve the product required by the warfighter. Along the way the team will be required to provide documentation to support their position. This documentation is reviewed and approved by a control board established for the purpose of maintaining scope, schedule, and budget. Assuring that each team understands the requirements is the responsibility of the control board. Training is essential to successful completion of each step in the process.

The streamlined process has resulted in establishing a benchmark at WR-ALC for sole source procurement. It was used in the implementation of our Multi-Product Contractor Depot and for all major sustainment efforts. SAF/AQ, AFPEO, WR-ALC and contractor senior leadership have lauded the team’s success. Requests for information on the Eight-Step process have been so numerous, we have published a guidebook in both hardcopy and electronic media formats. The guidebook has also been posted on the WR-ALC Contracting Homepage for World Wide Web users, <http://contracting.robins.af.mil>, is listed as a SAF/AQ Acquisition Reform success story on their homepage, and has been designated an Air Force Material Command Best Practice.

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# Are You Ready To Empower Your Work Force?

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**Jacqueline D. Stewart**

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*The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.*

## **Abstract**

Are you feeling the “crunch” from downsizing? Or are you just simply ready to use the total experience, skills, talent, and creativity of the work force to bring about levels of change, innovation, and productivity never before achieved? If so, empowerment can work for you. Discover how Defense Megacenters Warner Robins’ empowerment initiatives have evolved since 1988 and some of the many valuable lessons learned.

## **INTRODUCTION**

How do you empower a work force that is accustomed to waiting to be told what to do? How do you get them to assume responsibility and accountability? “The most powerful of all TQM ideas is that there is a way to use the total experience, skill, talent, and creativity of the work force to bring about levels of change, innovation, and productivity never before achieved—that there is an untapped reservoir of ideas and energy that TQM can release. The key to releasing this creative force lies in the process of empowering people.”<sup>1</sup> Our empowerment efforts began when we started our TQM journey in 1988. At that time we were the 1926th Communications-Computers Systems Group and a part of the Air Force Logistics Command (AFLC). General Hansen, who was AFLC’s commander and a strong visionary, helped set the tone for empowerment. He established the “Employee Bill of Rights.” All employees had the right to challenge business as usual; the right to be heard; the right to expect commitment to quality; the right to place quality before production; and the right to feel genuine pride in ALC products and services. Could this be real? With the establishment of the “Employee Bill of Rights,” General Hansen sent a clear message that AFLC would be an organization built on trust.

We based our empowerment effort on the fact that empowerment begins with respect for human dignity—the application of the Golden Rule, “Do unto others as you would have them do unto you.” “Early on we encouraged empowerment by eliminating monitorial supervision—watching people work and checking behind them.”<sup>2</sup> We will be the first to say that ending this practice did not come overnight. I can remember when we first eliminated time clocks and moved to sign-in sheets. We had one supervisor who spent almost the entire morning, from 0700-0900, watching the clock, trying to catch someone signing in earlier than when they really arrived and catching those coming in after 0900. Preparing the work force to become empowered requires patience and a commitment to educating the work force. “Putting your money where your mouth is”—is critical. We have invested in training all of the work force from top to bottom in understanding and fulfilling their new roles in an empowered environment. We cannot emphasize enough the importance of educating and showing the people what the new environment looks like and ex-



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plaining their new roles. We have learned that you need ongoing training to improve individual, team, and organizational performance. Our people have been trained in topics including TQM, Theory of Constraints, Customer Service, Teambuilding, Myers-Briggs Type Indicator (MBTI) and Diversity. Commitment of resources is just one way of showing the people we are serious about change. Our library also contains several books and videos on empowerment, leadership, change, teams, time management, and customer service.

## **TEAM EMPOWERMENT**

Our early empowerment efforts, back in 1988, were integrated into our process management transition. After all our key processes were established, we implemented pilot Process Action Teams (PATs). For each major process, the team was challenged to flowchart and tackle one major problem from that process. Quickly, these pilot projects taught us who the process experts are, the workers. The workers are right there every day with the process, they know what will and will not work. To encourage recommendations, we tried to implement as many of the teams' findings as possible to show that the leadership was committed to employee participation. Our pilot teams were making significant improvements. PATs soon became one of our most effective management tools. As new problems developed, we used special teams and Process Action Teams to tackle them. During our first year of teams, we had almost 20 teams in action. We were living our values and promoting teamwork throughout the organization.

We knew internal teams worked, but could cross-directorate teams with customers involved be effective? We would soon learn. We established a basewide team of customers, users, and computer programmers to develop methods to improve standardization, streamline procurement, and integrate management of word processing systems. Thanks to this team we saved over \$440,000. Through the use of contract consolidations, inventory reviews, equipment surveys, customer education, swap sessions, reutilization, and salvage, this team reduced equipment maintenance costs and improved customer support. We learned from over 88 process action teams that teamwork could produce timely and substantial savings. Faced with manpower cuts, we were also moving into new territory, fee-for-service. We would have to increase productivity, exceed our customers' expectations, and provide competitively priced services. In 1992, the organization decided to move to a new level of teams. Empowerment of day-to-day natural teams to become self-managing teams. Our organizational values supported using self-managing teams as the basic operational unit of the organization. This meant a new level of delegated authority. We trusted that the books on management were correct, "The primary purpose of delegation of authority is clearly to bring about an organization that is effective and efficient in accomplishing group objectives with the least cost in time, materials, and dissatisfactions."<sup>3</sup>

To prepare for the transition to self-managing teams, our Executive Quality Council realized that teams needed guidelines on how to become self-managing and the organizational structure needed to reflect a team-based structure. To undergo such a drastic change, buy-in from the people was required. At the time, we already had a Process Action Team (PAT) studying our TQM steps. The Council realized this was the perfect opportunity to empower the people to help shape the future direction of the organization. The team was renamed the PAT PAT. They were excited about being empowered, but a little worried about high level support. However, the team developed a self-managing approach that was not business as usual. This team had members from

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grades GS-5 to GM-15. Yes, our Deputy Director participated. He was not elected as the team leader, but nevertheless he attended the regularly scheduled bi-weekly meetings for almost 2 years. This level of support was never seen on any program in the past. Needless to say, his participation set the tone for teamwork and reflected the organizational values of teamwork and employee participation. The team was fully empowered and was very successful in its efforts. They developed the organization's first handbook on team guidelines.

We realized that providing guidelines for the teams wasn't the only requirement for the transition; the way the organization was managed would also have to change. Our environment changed constantly and the old paradigm of "Waiting to Be Told Everything to Do" was over. We had to create an environment that encouraged individuals to take risks and initiative to keep pace with the changing environment. In the book "Flight of the Buffalo," the author talks about the need to transform the work force from waiting on the lead buffalo to being like a flight of geese. "Buffaloes are accustomed to waiting on the lead buffalo; whatever the lead does the herd follows. If the leader does nothing, neither does the herd; whereas geese who fly in V-formation each take turns leading. When one goose gets tired, he falls back into the formation and another goose takes the lead. So, even if the lead goose gets tired, they still can reach their destination."<sup>4</sup> In our case, we wanted to transform our organization so that, if the lead buffalo needed to be off sick or on vacation, the work force could still function and not lessen productivity. Becoming more like geese is a part of our strategy for survival because typically, whenever we downsize, we lose our most senior people who most often have the leadership skills.

The author of the "Flight of the Buffalo" also captures very well the leadership principles that were required of our managers to function in the new empowered environment. First, the "leader must transfer ownership for work to those who execute the work. They must create the environment for ownership where each person wants to be responsible. Leaders coach the development of personal capabilities. Leaders learn fast themselves and encourage others also to learn quickly."<sup>5</sup> These are the basic principles behind our transition from natural process teams to self-managing teams.

How does a team become fully self-managing? We felt that the outside world viewed our organization as though one day someone said, "Let there be self-managing teams" and there were teams—teams who could overnight do all of the thing that managers have been trained to do over a number of years. This was a misconception. True, we did call our teams self-managing; however, our environment was undergoing a transformation from natural work teams to fully self-managing teams. Believe me, we knew it would be virtually impossible to expect people who have not been trained to become fully self-managing overnight. We established five levels for self-managing teams to achieve. Recognizing that each team had different skills and personality types, we let each team determine their milestones for achieving the levels. With each level came a new level of responsibility and accountability. Regardless of a team-based environment or a normal work environment, ultimate accountability for the organization rests with the Director. Our teams operated under delegated authority for issues impacting their teams only.

Self-management does not mean a leaderless environment, merely redefining roles. Leaders must focus on empowering the people rather than being "doers of the work." In our case, our coaches (division chiefs) provided the guidance teams needed. Depending on the maturity level of the

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team, the coach has to provide situational leadership. If the team has a new task they're unfamiliar with and do not have the skills to accomplish the task, the coach may have to do more directing. Whereas, if the team understands the task and has the know-how, then the coach may use more delegating. Years ago I read a newspaper article on managing change that puts it best: "Empowerment does not mean abandonment. Giving people permission to do something different is not helpful if they are unable to do it. The permission sets them up to fail." We learned that many people did not want to be empowered because it meant being responsible and accountable. Others were not afraid of being responsible but afraid of making mistakes; there were those who felt it was management's job to make all decisions; and there were those who cheered and felt honored that they could be trusted with decision-making authority. The level in which a team was in and the time they remained in that level was one indicator the coach could use in determining the type leadership the team needed.

### **EMPOWERMENT INITIATIVES**

Empowerment is not a gift you can just give employees and say you're empowered. Employees must act on the power given them to become empowered. Have you ever heard of WIIFM? With increased threats of downsizing and less job security, more and more people are asking "What's in it for me?" You will have to answer the question, "Why should I take on the new responsibility with no increased pay?" This is a question that cannot be ignored. Have you ever visited a restaurant and you were being served by an upset employee who felt treated unfairly by the employer? In most cases, who do you think the employee takes their frustrations out on? Of course, you the customer. We totally agree with the statement that employee satisfaction is a prerequisite for customer satisfaction. We have been required to look at innovative ways to keep our employees happy. Because we've had few opportunities to promote our people, we initiated a "volunteer process" to provide career growth. We have implemented a process where all new job openings in the organization are first announced internally, so that our employees will have an opportunity to volunteer to move to a new job and learn new skills. We have some employees who have been on the same job over 10 years. This change was welcomed. In our team environment, the selecting team could choose one of its members to participate in the interview process for promotions. The downside viewed by the potential promotee is, "You took my promotion."

During the furlough, team coordinators participated in the process of deciding which processes were critical. Teams learned the difficulties of making and living with tough decisions. Monthly the teams review and refine their input into our Staffing Plan, which shows our future manpower requirements projected over the next 3 years. And lastly, having a voice in the appraisal process was welcomed. A process action team was chartered to develop a system for team members to have input into their own and team members appraisals. The team developed an automated system where an employee could provide general comments or enter specific data as it related to each element of the standard appraisal form. We learned that teams needed help with providing specific and detailed information concerning their achievements. It was also suggested that we make the system available all year long so that, as accomplishments are achieved, they can be entered into the system. This process will work only if management is willing to verify the input and use it in determining the final rating. To expedite problem resolution in our operational environment, we have empowered the duty officer to act in the director's absence with director-level decision-making for *operational matters*. If our computers are down, the duty officer can order

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equipment up to the authority of the Director and call in any necessary personnel to get the systems operational. If you want your employees to have a greater sense of job satisfaction and respect and trust for the system...Empower them!

## **DECISION-MAKING**

We also empower our teams through the decision-making process. How do teams make decisions? We encourage the use of collaboration and consensus voting for tactical and strategic decisions. What is consensus voting? Consensus voting: thumbs up means you fully agree with the idea and will support it; thumb sideways means you were given an opportunity to voice your concern and you can live with and support the idea (not that it was your first choice); and thumbs down indicates that you do not agree with the idea, and you will not support it. Consensus is not appropriate for all decisions, particularly operational issues that need a quick response. While we encouraged it for tactical and strategic issues, however for operational issues, teams were expected to do what made sense. If the technical expert could solve the problem, there is no need for a team decision. Some employees thought “consensus voting” was required for every decision. Not that they were using consensus, it just made for a good topic of discussion. Often we heard comments such as, “We can’t get anything done because we must reach consensus.” We feel strongly that comments like these promoted a negative view of consensus decision-making. We had to remind folks to do what made sense. *If the building is on fire, there is no team decision, same as for operational matters, you involve only the necessary people.* Our DMC Senior Representative (Director) sent a clear message on the use of consensus voting. “Consensus voting is important for strategic decisions; consensus voting is appropriate for job assignments; but voting is not appropriate where quick decisions need to be made.”<sup>6</sup>

## **CHANGING THE REWARD SYSTEM**

We realized that we were asking teams to take on new and increased responsibilities, so our reward system had to change. The Awards Process Action Team received Council approval for a new awards program. This program was designed by the people for the people. The program included awards for teams as they made progress through the level required to become fully self-managing. Prior to the end of our self-managing prototype and our return to traditional management, the new awards would have become effective in October 1996. We have quarterly and annual awards at various levels of the organization and other forms of recognition to show appreciation to the employees. All DMC award recipients are chosen by the people. Every employee in the DMC regardless of grade or rank will eventually have an opportunity to participate on the selection board.

We recognize that our team members are motivated by different awards. Where some appreciate a pat on the back and a certificate, others are happier with cash or time off. To accommodate their needs the recipients of awards can choose what they like from the different categories of the Awards Bank. For example, the Team of the Year automatically receives a team plaque and each member receives a letter of commendation. In addition, each member selects from an additional category called member’s choice. We established division level Recognition Action Teams (RAT) so the employees from each division could have a voice in selecting the best candidate to represent their respective division. Timely recognition is key to a successful awards program. Careful

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consideration should be given for awards. The program will soon lose integrity if awards are given to individuals or teams that do not deserve them. We've learned that peer participation has eliminated many of the negative views of awards being only for management's favorites. Never ask a person, who you feel deserves an award, to write his or her own award nomination. Your time spent writing the nomination is just another way of showing how much you appreciate the nominee.

## **LESSONS LEARNED**

### ***PROCESS ACTION TEAMS***

What have we learned about teams? Process Action Teams are one way of getting the people involved. At the initial onset of a TQM program, when trying to sell the effectiveness of teamwork, select processes that need improving that will result in high dollar savings. Money is an indicator that almost everyone relates too. Early on involve as many people as possible. Ask for volunteers. Avoid the appearance of management selecting their "favorites" for pet projects. To achieve continuous improvement you will need participation from all employee, not just a select few. One of the problems we faced was PAT teams lasting too long. We had one team that lasted 2 years. Establish a projected start and stop date even if it has to be extended. Provide training on meetings and tools that can be used to improve processes. Assign facilitators to help keep the meetings on focus. And don't forget to celebrate the team's accomplishments. Everyone likes to be a part of a winning team.

### ***CROSS-ORGANIZATIONAL TEAMS***

Cross-organizational teams were used to work across traditional organizational barriers. We learned that cross-organizational taskings will take low priority unless management supports cross-organizational teams. Limit the number of teams on which an individual can participate. Our most frequent complaint was that the people on the teams were good workers, but they simply did not have the time needed to participate on the teams. Also, when participation exceeds a certain number of hours, the work should become a rateable item on appraisals. The team's sponsor should determine the skills needed on the team to make sure that people are not assigned to fill a square. Advanced agendas reflecting the purpose of the meeting should be provided to encourage participation. In many cases, we had poor attendance at meetings simply because the people felt as though the meeting was not focused and was a waste of time. If possible, provide a facilitator to help keep the group focused.

### ***SELF-MANAGING TEAMS***

#### ***ORGANIZATIONAL PERSPECTIVE***

What have we learned from our prototype of self-managing teams? Three of the hardest lessons, but most important are: 1) No matter how well your program is working, the failure to use a common language that the outside world understands will cause barriers; 2) It is better to apply self-management internally and provide a traditional view during external interfaces; 3) A self-managing workplace is viewed as a leaderless environment. We learned that job titles provide a common frame of reference and are associated with rank/grade. Even though our senior leaders'



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new titles, Senior Representatives, reflected the type environment we were trying to create internally, externally people were having difficulty understanding who was in charge. They were familiar with Directors and Division Chiefs, and we really blew folks' minds when we said the team could assign supervisory duties. That was interpreted as elected leadership, what a misconception! Teams could assign duties but not elect because there are certain duties and responsibilities, such as disciplinary actions, that cannot be delegated. We would never violate Office of Personnel Management's (OPM) rules—test the boundaries perhaps, but never violate them. We operated under the guidance of OPM 990-90, FPM Bulletin on Total Quality Management, which provides guidance for organizations operating in a TQM environment.

During the early phases of the self-management implementation we learned that, even though the answers to basic questions such as, "Why is the organization moving to teams?" seemed obvious, we still needed to explain why and how. Details and examples of how the new concept works should be provided. Most of all, remember that change does cause resistance and sometimes confusion, so explain up front that change is stressful. And, of course, you have to say it again and again and again.

To highlight a few other critical lessons learned from an organizational perspective: 1) To transition an entire work force to fully self-managing teams will take up to 5 years or longer. 2) Implementing a new way of managing the business will not eliminate existing operational problems and many of the existing personnel problems will not just vanish. 3) The chain of command does not go away. Even in a team environment we never forget our reason for being in business - support to the warfighter. And to make sure that happens, teams have to know the process for elevating issues and concerns. 4) Empowerment means creating an environment where people can unleash their talents and creativity to provide the highest level of service they're capable of. It does not mean management saying "go and become self-managing" and not provide the guidance teams need. 5) Teams will compare implementation among teams. Implementation must be across the board otherwise there will appear to be unfair treatment. 6) There is a misconception that in a team environment every decision in the organization is made by teams. Explain the decision-making bodies and their roles. For example, our DMC Council, a decision-making body, makes decisions on issues that cross boundaries. On many occasions we have been viewed as taking away team decision-making authority, when, in fact, the Council was acting within its authority and boundaries. I can't emphasize enough how important this is. 7) In a 24-hour operation you have to place emphasis on ensuring that all personnel are involved in the change process and receive the same training and resources as day shift teams. Emphasis must be placed on making sure the second and third shifts are included in the information flow. Also be careful of information filtering or the "you don't have a need to know" mentality for this way of thinking can drastically slow down the information flow. For instance, our teams were allowed to purchase requirements valued up to \$1,000 with team coordinator approval. Somehow, in our operations area, this was one of the best kept secrets. People on the first shift were deciding what was needed, and in two particular instances they were purchasing unnecessary items. 8) Managers and internal consultants need to dedicate some of their time on the various shifts. 9) Communication is critical. All teams need time to meet and discuss issues. During teambuilding, two of our teams gathered valuable insight when all three shifts were able to meet together. There were several things occurring on one shift that would slow down the process for the next shift. Neither team knew the impact.

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## *COACH'S PERSPECTIVE*

Some of the lessons we've learned from a coach's perspective are: Managers must be committed to the transition because a team's progress will depend largely on how serious they feel management is about the transition. Implementing a top-down training approach is invaluable because it helps the coach to explain what teams should expect during the training. Once you lower the decision-making process, you also have to lower the information needed to make timely decisions. The coach has to be really careful in reverting to making decisions for the team; the coach should advise, lead, and ask the right questions to help teams find the right answers. In critical situations, if the coach has to make the decision, the coach should go back to the team and explain how the decision was made so the team can learn to make "tough" decisions. Patience is a critical part of empowerment. I can remember hearing some of our managers say, "It sure would be easier to just make the decision and move on." Teaching the team how to become good decision-makers is a vital step in empowerment. We also learned that supervisory duties need to be at team level. Supervision at the division level is too far from the process and it creates the feeling that no one is accountable at team level.

The coach should spend time with the team explaining when and how decisions should be elevated through the chain of command. Remember this is a new way of doing business. Also remind the team from time to time to keep you in the information loop. Sometimes our day-to-day environment is so busy that it is easy to forget to keep everyone informed. Even though you've said once how the new environment should look, you cannot say it enough Repeat! Repeat! Because the approach is new the coach should continuously look for things the teams are doing right and provide positive feedback. Encourage! Encourage!

## *TEAM MEMBER'S PERSPECTIVE*

From a team's perspective, we have learned that not everyone will love self-management or will want to assume the responsibility that comes with self-management. Team members need to understand what is expected of them and that the transition is a part of the organizations' strategy for survival. They need to be reassured that the coach is available to help as needed. Provide ongoing training for the team and team coordinator. Team coordinator will need training in leadership, supervision, and conflict resolution to name a few. As the teams make progress in working together, conflicts will occur; therefore, teams need rules in place so that they can work out their differences. The reality of having to make tough decisions in a rapidly changing environment can be difficult. At times teams will need the coach to guide them and ask them the right question to help come up with the best decision. For many, attending and conducting meetings will be new. Provide help. The minutes of team meetings, while time consuming, have proven to be invaluable. It is the documented rationale for decisions that are made. It is also the creation of organizational history in the making.

## **ONGOING INITIATIVES**

For an empowerment environment to thrive, you must have initiatives in place as an ongoing way of doing business; otherwise the tendency will be to revert back to the old easier ways of doing



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business. Some of the current initiatives we have in place to ensure our teams have the tools they need are: 1) The Facilitators Team is responsible for promoting standardization of teambuilding and team execution across the entire organization. 2) A monthly supervisors' and team coordinators' forum is held to cross feed ideas and exchange suggestions on resolving team issues. 3) An on-site Organizational Development Consultant is available to help teams with problems they're encountering and to provide consultation and training in the following: TQM, Customer Service, Teambuilding, Myers-Briggs Type Indicator, Facilitation, Mediation, and Reengineering.

## **SUMMARY**

Defense Megacenters Warner Robins has provided the resources and continues to promote an environment that encourages the work force to take initiative. Are you ready to empower your work force? We are firm believers that empowerment works. If you are ready to trust your people to do their job, then empowerment can work for you. However, as with any other initiative, you must communicate your vision and establish a reward system for fostering empowerment. There are many perceptions of what empowerment means. For some it means no one is in charge, for others it means unleashing the creativity of the work force, and yet for others it means make up what it means as you go along. So eliminate confusion by clearly defining what empowerment means in your environment. Don't forget, empowerment is not a gift that you can just give teams and say "You're empowered." Teams must know what to do, and they must act on the power given them to become empowered. Are you ready for empowerment? Yes, you are ready for empowerment if your organization or business **E**mploys **M**ethods that **P**rovide **O**pportunities for **W**orkers to **E**xcel **R**egularly!

## **NOTES**

<sup>1</sup>Clifford E. Carroll, U.S. Air Force. "Lessons Learned Briefing" (WR-ALC Robins AFB GA: Unpublished, 1990), p. 9.

<sup>2</sup>Ibid, p. 9.

<sup>3</sup>H. Koontz & C. O'Donnell, Principles of Management (New York: McGraw-Hill Book Company, Inc., 1959), p. 90.

<sup>4</sup>J. Belasco & R. Stayer, Flight of the Buffalo (New York: Warner, 1993), p. 21.

<sup>5</sup>Ibid.

<sup>6</sup>Email Memo, (U), Donald W. Drumtra, Director, DMCWR/WEW, "Self-Managing, Coaching & Decision-Making," Sep 1994.



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# Development of an IPT Business Strategy

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**Abstract:** This paper uses a simple method (Strategic Business Model) to enhance the Air Force Strategic Planning Model. For many organizations the major elements of a strategic plan are lost in the eleven-step process of the Air Force Strategic Planning procedure. A simpler method needs to be employed. The Strategic Business Model/Method guides an organization through the process without missing the major parts of a strategic plan. Further, it streamlines the process. Once the overall strategy chart is developed, all planning becomes subordinate to it and will self-align the organization. All elements under the main strategy chart will have the same overall approach.

I. **Introduction:** This paper describes the process used to develop a business strategy. There are four fundamental areas to building a structured business strategy; Management, Marketing, Financial, and Technical. Each area is directly linked to the other areas and should be a perfect match to the overall strategy. Figure #1: Strategic Business Model shows graphically how the parts fit together as a whole. There are three other important areas that also effect the strategy: communication, management information systems, and deployment. The entire strategy is surrounded by current reality or “seeing the world as it is.” As we follow the process each of the areas will be examined and expanded to develop an executable plan.

II. **Business Strategy:** There are several basic questions that must be asked in the development of a comprehensive strategy. Examples are: What business are we in? How’s business? How are decisions made in our organization? What is the company’s present business strategy, if any? What is our offering? Who are our customers? What do they want? What do we want? Is there a match between what we want and what the customers want? How do they know about us? How do they obtain our offering? What is the current market? What is the future market? How will our offerings change? Where are we going? However, the most important question is, How do we generate wealth or, in other words, viability.

The viability question is central to the entire business strategy. Should we even exist? Or in other words, is what we offer something that is needed and wanted? If these answer to the questions are yes, then we have a very good starting point. If the answer is no, its time to change products or get into a new business. Once we have determined that the service or product we create is both wanted and needed we can start.

First Step:

1. Describe in enough detail what the service or product that you offer.
2. List whom the primary and secondary customers are for this product.
3. Determine and list the customers’ needs.
4. Compare the product to the customer’s needs.
5. See if there is a mismatch.
6. If there is a mismatch - determine why are they our customers?

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If we produce a product that is both needed and wanted, the customers usually give us something in return for our services. In some cases, it may be just a thumbs up for the program.

In many Air Force organizations there is a difference between who the customers are and who the users are. In our case, the customers pay the “bills.” and the users are the warfighters who need the products we produce. To get funded we have to appease both the customers and the users (in this paper I will use the term “customer” to refer to both users and customers). Next, we need to develop a vision statement or end-result that takes into account both the product and the customers. This is a statement of where we want to be in the future. It can be short term or long term. When writing end-results don’t use verbs - use nouns. Verbs are the hows, not the whats. For this exercise we want the “what’s” [linking end-results to current reality].

Second Steps:

1. Get a clear picture of what you want your End-Result (ER) to be.
2. Write it down (Do not to use words like more, less, improved, enhanced...)
3. Check to make sure the statement is consistent with the product you develop.
4. Rewrite the ER until satisfied it meets both yours and the customer’s needs.

Once the end-result or vision statement is completed a baseline or current reality must be developed in relation to the end-result (I will use the term current reality instead of baseline). See Figure #2: Strategic Planning Chart to get a better understanding of the relationship between the end-result and the current reality. To understand where you currently are in relationship to where you want to be, you must next identify the current realities in relationship to your ER.

Third Step:

1. Write down all the pertinent current realities in relation to the desired end-result.
  - Ensure they’re both positive and negative (this doesn’t mean good or bad)
  - Stay away from personal attacks
  - Remember these are just statements of fact

Identifying current realities is a way to describe the truth as it stands today. It’s not cast in stone and will change as you move toward or away from your desired end-result. You are baselining your current position in the market place.

Once you have a complete listing of current realities you’re ready for the next step. Here you look at the current realities in relationship to the end-result and ask, “Given the present current reality (CR) and the fact that I want to create my desired end-result what action must I take?” For example, ask the following action question: “*Given the CR that there is no information on Hardened Target Weapon Systems, what action must I take?*” Answer: “*Collect and sort data on Hardened Target Weapon Systems.*” This process is used until you have all the action steps necessary to achieve your end-result. Once completed, you should have a chart that looks much like Figure #2.

Once step three is completed, step four aids in the development of the action plan.

Forth Step:

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1. Pick any current-reality and ask the “Action Question”
  2. Write down the action
  3. Continue the process until you have adequate action steps to meet requirements
  4. Put a final date on the end-result (NLT date)
  5. From the NLT date back date all the action steps in order
  6. Assign POCs to each action item

This is not an easy process and can take 2 or 3 full days to complete. Once completed, it is even harder to put into action. It’s possible to obtain your desired end-result even if you don’t have a total consensus of the team; however, without management support it’s doomed from the start. Just remember the words of the great success master Napoleon Hill, “Most people don’t recognize success because he is usually dressed in bib-overalls and looks like work.”

Next, take the action statement and telescope it out just like you did with the first end-result. Each action step may become an end-result itself. If it is necessary to telescope out the action step, as in the case of our example, go back and follow steps two through four. You may have to reword the action step so it becomes an end-result. When it no longer makes sense to break down the action item, then you’re done with the *overall* business strategy. Now you know what must be done but not how it’s to be accomplished. This is where the four-section model can be useful.

## Developing the Business Strategy

**The Business Strategy:** What goes in to a business strategy? This is an excellent question to ask. It is a question that many new and potential team leaders should ask, but oftentimes don’t. The body of the business strategy can be divided into four distinct sections: 1) the management strategy, 2) the financial strategy, 3) technical strategy and 4) the marketing strategy. Addenda to the business strategy should include the executive summary, supporting technical documents, and financial budget.

**The Management Strategy:** Managing an Integrated Product Team, like any other team, requires more than just the desire to do a good job. It takes dedication, persistence, and the ability to make decisions about team members, technology, and finances. The management strategy must work with the other strategies so they match the overall business strategy. Remember from the model, there are four interlocking strategies that make up the business strategy; management, technical, marketing, and financial.

Management strategy is nothing more than getting the job done *with* your people’s help. Your management strategy, along with your technical, marketing and financial strategies, sets the foundation for and facilitates the success of your Integrated Product Team. This is how we manage the people, organize the management structure, define roles and responsibilities, and disseminate team expectations. We will now look at the management strategy and see how it ties together the other three strategies to become a unified business strategy.

Like money and equipment, people are resources. That’s why most companies have a Human Resources Department. You will soon discover that team members and staff will play an important role in the total operation of your Integrated Product Team. Consequently, it’s imperative

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that you know what skills you possess and those you lack since you will have to find personnel to supply the skills that you lack. Additionally, it is imperative that you know how to manage and treat your team members. Make them a part of the team. Keep them informed of, and get their feedback regarding, changes. Team members oftentimes have excellent ideas that can lead to new market areas, innovations to existing products or services or new product lines or services which can improve your overall competitiveness.

Your management strategy should answer questions such as:

1. How does your background/team experience help you in this team?
2. What are the team's weaknesses and how can you compensate for them?
3. Who will be on the staff?
4. What are their strengths/weaknesses?
5. What are their duties?
6. Are these duties clearly defined?
7. What type of assistance can you expect from the team members?
8. Will this assistance be ongoing?
9. What are your current personnel needs?
10. What are your strategies for finding and training personnel?
11. Will management support training for you and the rest of the team?
12. If additional training is needed will management provide this training and cover the cost?  
Or will you have to cover the cost of additional training?
13. What benefits, if any, can you offer?
14. Do you have a budget?
15. How do you track time spent on the project?

The operating procedures, instructions, and materials devised by management should be included in this section of the team business strategy. Study these documents carefully when writing your team business strategy and be sure to incorporate this material. With this information the next step is to develop the team description.

**Team Description:** In this section, provide a detailed description of your team. An excellent question to ask yourself is:

“What is the major purpose of **this** team?”

In answering this question, include your products, market, and services as well as a thorough description of what makes your team unique. Remember that as you develop your team business strategy, you may have to modify or revise your initial purpose for chartering the team. The team description section is divided into three primary sections.

- Section 1: Team Formation (describes your team)
- Section 2: Product/Service (what is your offering)
- Section 3: Team Structure (team motivation/vision)

**Section 1. Team Formation:** When describing your team, generally you should explain:

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1. Team type: demonstration, integrating, or service.
  2. What your product or service is.
  3. Is it a new team?
  4. Why your team is needed?
  5. What are the growth opportunities?
  6. How will this IPT impact growth opportunities of the organization?
  7. Where will your team meet? How often?
  8. What have you learned about Integrated Product Teams from outside sources (industry, academia, other Integrated Product Team leaders, quality teams, publications).

In the description of your team, describe any unique aspects or special features that will aid in the obtainment of the desired ER. The description of your team should clearly identify goals and objectives and it should clarify why you are, or why you want to be.

**Section 2. Product/Service:** Try to describe the benefits of your goods and services from your customers' perspective. Successful teams know, or at least have an idea of, what their customers want or expect from them. This type of anticipation can be helpful in building customer satisfaction and loyalty. And it certainly is a good strategy for beating the competition or retaining your competitiveness.

Describe:

1. What you are selling or service provided.
2. How your product or service will benefit the customer.
3. Which products/services are in demand.
4. What is different about the product or service your Integrated Product Team is offering.

**Section 3. Team Structure:** The structure of your team can play a decisive role in its success or failure. Your structure should be built around your customers; it should be well organized and provide a sense of purpose. Consider these questions when addressing this section of your team business strategy:

1. What are your team needs?
2. What kind of space will you need?
3. Does the team structure match the purpose?
4. Are the rooms in your building desirable?
5. What incentives are there to be a team member?
6. Do you have adequate funding to support the team infrastructure?
7. What would motivate someone to support your team?
8. Who's help do you need to make this work?
9. What are the team member's responsibilities?

(Note: It may be a good idea to make a list of questions you identify when developing your team business strategy. It is recommended that you keep a journal to annotate and organized your questions. As you answer each question write it down in the team journal and review this journal



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at the end of each week. It's amazing how much you can learn by keeping a journal.) Management should assist you in organizing your Integrated Product Team. Take advantage of their expertise and develop a management strategy that will ensure the success for your Integrated Product Team and satisfy the needs and expectations of team members, as well as the customers.

**The Technology Strategy:** Technology is paramount to most organizations. You, as a team, must know what the cutting edge of technology is and how to harness this for the benefit of the customer. The technologies that a team should pursue must be directly linked to the users' needs. However, there is a need to "play" with new ideas and create new technology. The "dumb idea" of one century is the "common sense" of the next. This doesn't mean that a large part of the budget should be spent on these innovative new ideas either. A small but targeted amount of the budget should be set aside to help further your competitive edge. A good technology strategy should answer the following questions:

1. What technologies should we pursue?
2. Are we the best ones to develop this technology?
3. Should we buy off the shelf technology or build new?
4. Who is the leader in this technology field?
5. How many different technologies can we manage?
6. How much funding should we set aside for "innovation?"
7. What is our major purpose and how does that fit into our technology strategy?
8. Do we have the infrastructure to support our main technological purpose?
9. What approach should we use to select technologies?

The major part of this strategy is to ensure that you fit in with the overall strategy of the organization and they support you. The technology strategy is the bases for future products that will launch new technologies into the next generation.

**The Marketing Strategy:** Marketing plays a role in successful team ventures. How well you market your Integrated Product Team, along with a few other considerations, will ultimately determine your degree of success or failure. The key element of a successful marketing strategy is to know your customers — their likes, dislikes, expectations. By identifying these factors, you can develop a marketing strategy that will allow you to fulfill their needs. Identify your customers by their desires, expectations, budget level and frankly, your customers' importance. At first, target only those customers who are more likely to support your product or service. As your customer base expands, you may need to consider modifying the marketing strategy to include other customers. Develop a marketing strategy for your Integrated Product Team by answering these questions.

1. Who are your customers? Define your target market(s).
2. Are your markets growing? steady? declining?
3. Is your Integrated Product Team market growing? steady? declining?
4. Where are the other segments?
5. Are your markets large enough to expand, depending on teams restrictions?
6. How will you attract, hold, increase your market share? Will management provide assistance in this area? Based on the business strategy, how will you promote your

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product?

7. What pricing strategy, if any, has the team devised?

Once you have answered these basic questions you will need to look at three other areas; 1) competition, 2) cost analysis, and 3) advertising & public relations.

1. **Competition:** Competition is a way of life. We compete for jobs, promotions, and scholarships to institutes of higher learning, in sports — and in almost every aspect of our lives. Branches of service now compete for customers as in any business environment. Budget cuts can put a successful team into a tailspin causing them to disappear overnight. When considering these and other factors, we can conclude that research and development is a highly competitive, volatile arena. Because of this volatility and competitiveness, it is important to know your competitors.

Questions like these can help you:

1. Who are your five nearest direct competitors?
2. Who are your indirect competitors?
3. How are they doing? steady? increasing? decreasing?
4. What have you learned from their operations? from their advertising?
5. What are their strengths and weaknesses?
6. How does their product or service differ from yours?

Start a file on each of your competitors. Develop a computer program/database of their advertising and promotional materials and their customer strategy techniques. Review these files periodically, determining when and how often they advertise, who they talk to and how they sell themselves. Study the briefing used in the advertising and promotional materials, and their sales strategy. For example, is their briefing short? descriptive? catchy? or how much do they lobby? Using this technique can help you to understand your competitors better and how they operate their organizations.

2. **Cost Analysis:** Another marketing technique is to use your cost estimates to improve your overall competitiveness. Although it will be based on the strategy devised by the team, it may be a good idea to get a feel for the cost estimates your competitors are using. That way you can determine if your cost estimates are in line with competitors in your market area and if they are in line with industry averages.

Some of the cost estimate factors you may use, depending on the technology type, are:

- Past comparisons
- Component level
- Contractor vs. government
- Cradle to grave
- Material costs
- Labor costs
- Overhead costs

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The key to success is to have a well-aligned strategy, to establish your policies, and to constantly monitor cost estimates.

**3. Advertising and Public Relations:** Having a good product or service and not advertising and promoting it is like not having a team at all. Many team leaders operate under the mistaken concept that the team will promote itself, and channel money that should be used for advertising elsewhere. Advertising and promotions, however, are the lifeblood of a team and should be treated as such. Devise a strategy that uses advertising and networking as a means to promote your Integrated Product Team. Develop short, descriptive copy (text material) that clearly identifies your products or services. Use catchy phrases to stimulate the interest of your readers, listeners, or viewers. In some cases, management will provide advertising and promotional opportunities as part of an on-going demonstration; you may need approval to use any materials that you and your team develop. Whether or not this is the case, as a courtesy, allow management the opportunity to review, comment on, and if required, approve these materials before using them. Make sure the advertisements you create are consistent with the image management is trying to project. Remember the more care and attention you devote to your marketing program, the more successful your Integrated Product Team will be.

**The Financial Strategy:** Sound financial management is one of the best ways for your team to remain alive. How well you manage the finances of your team is the cornerstone of every successful team venture. Each year team leaders become the victims of poor financial management and potentially successful teams fail because of it. As a team leader, you will need to identify and implement policies that will lead to and ensure that you will meet your financial estimates.

To effectively manage your finances, devise a sound, realistic budget by determining the actual amount of funds needed to operate your Integrated Product Team (start-up costs) and the amount needed to keep it running (operating costs). The first step to building a sound financial strategy is to devise a start-up budget. Your start-up budget will usually include such one-time-only costs as major equipment, computer equipment, etc.

The start-up budget should allow for these expenses:

- Travel
- Equipment
- Supplies
- Advertising/promotions
- Salaries/wages

Next, an operating budget is prepared. The operating budget will reflect your priorities in terms of how you spend your funds, the expenses you will incur, and how you will meet those expenses (income). Your operating budget also should include funds to cover miscellaneous expenses of operation (DoD taxes). It should allow for the following expenses:

- Travel
- Advertising/promotions
- Miscellaneous expenses

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- Supplies
  - Salaries/wages
  - Repairs/maintenance

The financial section of your business strategy should include capital equipment, supply list, balance sheet, and break-even analysis. The cost estimate spreadsheet should include a year to year summary, detail by month for the first year, and detail by quarter for the rest.

Your strategy should include a list of all projections. Unless you are thoroughly familiar with balance sheets, get help in preparing it. Your aim is not to become a financial wizard, but to understand the financial tools well enough to gain their benefits. Your funds manager can help you accomplish this task.

**Conclusion:** This paper has presented a process to develop an IPT business strategy that will self-align the entire organization. If you follow the process and answer the questions, you should be able to develop a strategy that will out perform the competition. However, no strategy is static. You must continually review and update it, in some cases daily. Once the strategy is developed and approved, the challenging part is deploying within the organization.

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Lt. Col. Sam Crouse is the Operations Officer, 47th OSS, Laughlin AFB, TX. He is a Command Pilot with over 4,000 hours in the U-2, B-52, and T-37, and is a current T-38 Instructor Pilot. Lt Col Crouse is certified to administer the Kirton Adaption-Innovation Inventory and the Myers-Briggs Type Indicator. He was certified by ASQC as a Certified Quality Examiner in 1993 and assisted in writing the Certified Quality Manager Examination. He also served on the SECAF Unit Quality Award Board of Examiners for the past two years. Lt Col Crouse previously served as the Director of Quality, HQ Air Intelligence Agency.

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# Improved Problem Solving - A Theory-Based Approach

## Kirton Adaption-Innovation Theory and the Kirton Adaption-Innovation Inventory

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### **A Brief Description of Adaption-Innovation Theory**

A-I Theory holds that creativity, problem solving, and decision making are linked by the resolution and generation of novelty. As human beings, we are continually running up against new or newly discovered situations that we deal with by fitting them into some model, or in Kuhn's (1970) terms 'paradigm'. As we do, we frequently create additional novelty, new problems that arise out of our solution to the first. An example is man's attempts to place the motion of the heavenly bodies into some sort of structure so that they are understandable and predictable. An early attempt was the geo-centric model in which all heavenly bodies were believed to revolve in perfect circles around the earth. As observations improved, particularly after the invention of the telescope, it became clear that there were certain objects (planets) which did not move around the earth in perfect circles. Thus the solution to the problem: "how do the heavenly bodies move" generated a new problem: how to account for the motion of the planets. One solution offered was the existence of epicycles where the planets follow a circular path about the earth, but they occasionally move in additional perfect circles imposed on the basic circular path. This was a solution designed to improve the existing paradigm (structure) while preserving it. Another solution held that the earth and the planets revolved around the sun - the helio-centric model. This solution broke the original paradigm. In spite of the fact that one of these solutions eventually proved correct and one incorrect, both were creative solutions to account for the motion of the planets. A solution need not be paradigm-breaking to be creative.

All creativity, problem solving, and decision making occur within structure. Language is structure. Language enables you to think while the words in your language limit what you can think about. The choice of the problem to solve is structure as is the kind of solution you want (paradigm-consistent or paradigm-breaking). If we consider artistic creativity, structure lies in the choice of medium, subject, technique, etc. Structure is both enabling and limiting. The challenge for effective management, leadership, and problem solving is to choose the correct amount of structure. This choice lies on a continuum according to the theory. At one end, no structure and on the other, rigid structure. No thinking can occur at the extremes. Within the range of useable structure, however, the "correct amount" is different for different situations (i.e. different problems in different contexts).

A-I Theory states that some individuals prefer more structure in creativity, problem solving, and decision making and more of it consensually agreed by the group. People in this group, called Adaptors, prefer to work within the existing paradigm, improving it rather than breaking it. Some people prefer less structure and less of it consensually agreed. People in this group, called Innovators, may work within or outside the existing paradigm, but are frequently outside (at least of the lesser ones, if not the major ones). In problem solving, Adaptors will: tend to accept problems as given; seek early resolution; seek to limit disruption; and tend to produce immediate increased efficiency. Adaptors will

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tend to generate a few solutions that are novel, creative, clearly relevant to the problem, readily acceptable within the existing paradigm, and regarded as safe rather than risky. The aim of adaptors in problem solving is “doing things better” (continuous process improvement). Innovators when solving problems will frequently redefine all, or at least a noticeable part of, the problem. They are task oriented (not paradigm oriented) and will generally tend to seek long term gains rather than immediate increased efficiency. Innovators will tend to generate numerous solutions that are novel, creative, regarded (by the Adaptors) as radical or disturbing, and not readily acceptable within the paradigm. Innovators, when solving problems, aim at “doing things differently” (process re-engineering) This difference in problem solving styles can generate problems but the two styles complement each other beautifully. The strengths of each compensate for the weaknesses of the other.

Innovators are invaluable in times of radical change or crisis (when re-engineering is needed). In more settled times, they ensure that fresh approaches to problems are at least considered. Innovators may have difficulty in fine-tuning on-going operations. They are less comfortable with detail than Adaptors. Adaptors are more comfortable with details and are essential for on-going operations (when continuous improvement works well). Adaptors may have difficulty dealing with unexpected changes. Innovators are better at coming up with breakthrough ideas. Adaptors are better at making these “wild” ideas work, as long as they buy into them in the first place.

Speaking of Adaptors and Innovators as discrete groups is a convenient device for communication. However, it is vital to keep in mind that all large populations measured fall on a normal distribution curve with a range of scores of about 100 points. This continuous scale measures the amount of structure an individual prefers to use in solving problems. Asking at what point on this continuous normal distribution curve one becomes an Adaptor or an Innovator is like examining a normal distribution curve representing the heights of individuals and asking at what point one becomes “tall” or “short.” What is important is the difference in preferred problem-solving styles (KAI scores) of individuals or groups who must work together. It is only the difference in scores that is significant, not the absolute score. People are “relatively adaptive” or “relatively innovative” compared to each other just as individuals are “tall” or “short” only by comparison.

Preferred style in problem solving is not the same as behavior. It is only one of many factors influencing behavior. A few of the many other influences are: motive, beliefs, attitudes, skills, opportunity, and social environment. People frequently operate outside their preferred styles using what is called coping behavior. There is a cost in stress on the individual for operating away from preferred style. Motivation to accomplish the mission can enable people to use coping behavior. When the demands of the moment ease, they will try to return to their preferred styles.

There are both styles and levels of creativity, problem solving, and decision making. Style determines how you prefer to be creative or solve problems. Level determines how successful you will be at it. Adaptors and Innovators may both operate at high or low level due to (e.g.) intelligence, talent, motive, opportunity, etc. Style and level are independent. They do not correlate with each other.

### **Applications of Adaption-Innovation Theory**

Which style is appropriate for a particular problem depends on the nature of the problem, the context of the problem, and the type of solution desired (paradigm-consistent or paradigm-breaking).



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We probably do not want to use only high Adaptors in the Air Force while we continue to shape our new role following the dissolution of the Soviet Union. On the other hand, we do not want to use all high Innovators to do maintenance on our aircraft. One could reverse these examples and the same would be true. Careful examination of the task at hand is a key requirement for leadership in forming teams and assigning projects and tasks whether long or short term. A-I Theory and the KAI help to choose the best resources for a given task. To argue that one style or the other is “best” is to say that the value of a particular tool is independent of the nature of the problem. If all you choose to use is a hammer, the whole world looks like a nail. As leaders, managers, and facilitators, it makes more sense to give our teams and organizations the largest possible tool kit to enable optimal problem solving. A-I Theory should be one (but only one) of the tools in our kit. In addition to its own direct use with teams, it can be used to give insight into when other tools are appropriate and which tools may work best - an invaluable resource for facilitators.

A-I Theory enables better problem solving and decision making by enabling the examination of both the problem and the desired form of the solution in light of the Theory. Given the nature of the problem and the desired solution, the KAI enables ensuring that the team working on the problem has the right mix of problem solving styles. It is usually not necessary to use the KAI to select the team members. However, once the team begins to operate and if the team is knowledgeable of A-I Theory, the leader or facilitator can guide the team in adding one or more individuals with the styles the team determines it needs to deal optimally with its problem. Knowledge of the different styles and their value also aids the team in considering a wide range of solutions.

A-I Theory enables more effective teams, both management and process improvement. The leader or facilitator can better understand, and thus more effectively nurture, the team’s internal dynamics. It aids the facilitator or leader in choosing the appropriate tools for the team to use at the right times. If decreased structure is needed, tools such as brainstorming or guided fantasy may be appropriate for diverging or “funneling out.” If more structure is needed, Kepner-Tregoe or Pareto analysis can be used for converging or “funneling in.”

A-I Theory aids in dealing with change, including introducing change in an organization. People deal with change by thinking about the likely impact of the change on them and this calculation of impact is influenced by individual problem solving styles. No one resists all change, but people may resist specific change imposed on them if they do not understand it or if they believe it will harm them. A-I Theory provides insight into the importance of communicating the details of change to people and aiding them in seeing ways in which this change may be beneficial or at least value-neutral to them. In addition, it provides insight into how to communicate the need for change effectively to individuals with different needs for structure.

A-I Theory enables more effective management and leadership through an understanding of structure and an appreciation that different people need different amounts to function best as problem solvers. The right amount of structure is determined by the nature of the problem, the desired form of the solution, and the context within which the problem solving is taking place. Supervisors can use the KAI to provide insight into the amount of structure (detailed guidance) employees need to best accommodate their individual problem solving styles and enable them to be most effective.

A-I Theory and the KAI provide a key insight into a potential source of conflict between indi-

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viduals and between teams. Research indicates that ten points difference in score between individuals (five points between groups) is just noticeable. At twenty points, problems may arise between individuals. Beyond twenty points problems may increase exponentially. The source of these problems can easily be seen by considering how Innovators and Adaptors value themselves. Innovators value themselves for being: risk takers, full of ideas, intuitive, daring, unconstrained by the past, and willing to challenge assumptions. Adaptors value themselves for being: supportive of others, able to make best use of resources, stable, sound, consistent, and methodical. As is clear from these two lists, Adaptors and Innovators have distinctively different core values. They do not speak exactly the same problem solving language. However, they think they are speaking the same language and this can be a major source of difficulty. The most diverse teams (largest range of KAI scores) have the greatest potential ability to solve problems, but these diverse teams require more effort to keep them together in the face of inter-personal friction.

Experience in the use of A-I Theory and the KAI has shown that when a group is thoroughly briefed on A-I Theory and informed of their KAI scores, they will begin to value this diversity and consciously use it in problem solving. Once this happens, groups tend to have a greater tolerance for, and appreciation of, other diversities such as race, gender, age, social background, etc.

### **Uses of Adaption-Innovation Theory and the KAI**

The most dramatic scientific evidence for the effectiveness of A-I Theory and the KAI in improving problem solving is the research reported by Dr Peter K. Hammerschmidt, Eckerd College, Florida. The research was carried out over some years using attendees at a week long leadership development program offered at Eckerd College. Teams of eight, made up of two sub-teams of four persons, were selected from the mid- to upper-level managers who were students in the classes. The teams participated in the "Hollow Square: A Communication Experiment" published by Pfeiffer and Jones. One team was the planners. One was the implementers. The task was for the planner team to successfully plan and then communicate to the implementer team a method of assembling a puzzle consisting of 16 differently shaped wooden pieces to form a hollow square with a square opening in the middle. The implementers then had to assemble the puzzle correctly. There was a time constraint on the entire exercise. For 50 pairs of teams selected at random, the success rate was 52%. When 33 pairs of teams were selected based on KAI score with Adaptors doing the more structured job of planning and innovators doing the less structured job of assembling, the success rate was over 82%. This is an increase in problem solving success of 58%.

An Air Force natural work group approached a facilitator certified to administer the KAI with a request for training to enhance working relationships. The team had previously taken the KAI and the team average was 88, on the adaptive side of the population mean (95). Through discussions with the team, the facilitator determined that the team members sensed they did not have all the skills needed and he chose to administer the Team KAI. This instrument is filled out by each member of the team answering as if for an imaginary person needed to complement the existing members. The average of the resulting individual scores was 111. The facilitator then led a discussion by the team of their needs and guided a brainstorming session which suggested that an Innovator was needed. The facilitator then asked each member to write down the KAI score they felt the new member should have. The average was 122. The actual data from the Team KAIs was presented to the team and they agreed that they needed someone relatively innovative. It was not possible to add another person to the work group, so

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the facilitator guided an exercise in which the team laid out a plan to enable them to proceed effectively without an additional member. Use of the Team KAI can be very effective even when it is not possible to add a new member because it enables the team to come to consensus on what the team is lacking. Sometimes there is a wide disagreement (spread of scores) among the team members on the Team KAI. This can be used to lead a discussion enabling the team to identify the fundamental disagreements on the needs of the team that resulted in the lack of consensus.

In another Air Force case, Team X was commissioned as a cross-functional working team. The team's charter was to implement a new program in an organization consisting of 1500 personnel. While the team's charter was limited to education and training, there were other areas that had to do with advising leadership of obstacles in implementing the new program and proposing solutions.

A number of volunteers came forward to apply for the team. The organization selected four individuals for the team from various departments and sent them to a train-the-trainer course. During the forming phase of the team, differences in problem solving style became apparent. The KAI was administered about one month after the team was selected. The instrument yielded scores of 143, 137, 125 and 65 (average score 117.5). The team had taken the instrument voluntarily and had discussed the results of the inventory during the feedback session. Proliferation of ideas was the biggest challenge to the effectiveness of the team. There were many challenges faced by the team in its task. Nevertheless, there were no shortages of ideas. The team could not, however seem to come to closure on items. Additionally, when a course of action was agreed upon, it was not long until either 143, 137 or 125 proposed changes or unilaterally changed the plan. 65 in the true sense of adaptor style was the one who seemed to be able to ask the "what about" questions that would refocus the team on the task. However, that focus was short lived.

Eventually, after repeated attempts and some failures, the innovators came to rely more on 65 to keep them focused. They referred to 65 as "the glue" and would often use 65's viewpoint as the tiebreaker. While the team saw the value of the KAI, it simply could not, over a long period of time, constrain the proliferation of ideas and keep a focus on the overall task at hand. 65 was extremely quiet and would often sit back and become overwhelmed by the discussions between the innovators. While attempting to process the ideas, 65 would routinely stop communicating until one of the innovators would either notice his detachment, or ask for his input in order to come to closure on an issue. This team continued operating in this manner. About six months into the effort another member joined the team. The new team member's KAI was 140. This new team member added to the proliferation of ideas.

Personality clashes that occurred on the surface were predominantly between the innovators. 65 was concerned with group stability and started to take on the role of peacemaker. The team expressed many times that 65 was responsible for holding the team on course, yet in practice it could not stay on course. Around month eight of the effort, 65 approached the team leader with a request to return to his normal job and be removed from the team. The team leader expressed surprise and concern to 65, reasoning that if he left the team would not have anyone from the "adaptor side" to hold it on course. After a week of negotiation, 65 returned to his normal job.

The team, faced with no one to hold it together (stability being a major contribution of adaptors), discussed its situation. They decided to search for an adaptor "volunteer" to replace 65 on the

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team. While the team searched via word of mouth, no one they approached seemed interested. Eventually, the team fell apart. The strain of keeping on course and inability to come to closure with the vast proliferation of ideas was too much.

This is a case where the KAI was relatively new to the organization. The KAI was not used to select the team members to the team and the team was not balanced with KAI scores. While there was no shortage of ideas, the team had extreme difficulty coming to closure and staying on course. In the future, leadership can learn that balance in team's of this nature is extremely important. The organization's average KAI score being more than 20 points away from the team score definitely led to communication difficulties as Adaption Innovation Theory predicts.

Cmdr Alice Cahill, NC, USN, has administered the KAI to approximately 500 senior medical managers as part of a series of problem solving workshops. The response has been uniformly positive. Many of these senior managers have asked Cmdr Cahill to come in and administer the KAI and do the workshop for their staffs. Cmdr Cahill also administered the KAI to a group made up of Admirals. The average KAI score of the group of Admirals was significantly more innovative than that of the senior managers. As a result of their understanding of A-I Theory and knowledge of the difference between their scores and those of the senior managers, the Admirals were able to see why some of the changes they had been trying to introduce were not moving along as well as they wished. Using A-I Theory, they were able to determine how to communicate more effectively with their senior managers to get the changes they desired back on track.

Col Mike McGee, NDU, and a colleague have used the KAI in conjunction with a course called "Creative and Critical Thinking." Col McGee reports that the students accept the validity of the KAI very well. He finds the KAI extremely useful in several ways: as a non-threatening context for the discussion of creativity; as a way to measure the problem-solving styles of the students; and to help students take a look at a measurable individual difference and see how such differences can interfere with effective interpersonal communications.

Col Gail Arnott, Air War College, has used the KAI since 1990 with students, as part of the orientation for new faculty members, and for faculty team building. Col Arnott reports that the KAI is well received by senior service students. Students and faculty use the KAI scores for self-awareness and team building. Comments are invariably positive, for example: "We ought to use this throughout the service;" "I wish everyone could take this;" "Can my family take this?"

At the U.S. Army War College, Dr Herb Barber uses the KAI similarly to NDU and the Air War College. First, it is used early in the academic year as part of a program on creative thinking, team building, and management of change. In the team building area, he stresses the diversity within the seminar along various dimensions (e.g., KAI, MBTI, prior assignments, etc.). KAI demonstrates the multiple perspectives within the group and at the same time anticipates potential interpersonal conflicts and disagreements that may occur as a result of these differences. He also uses KAI as part of a discussion of significant changes which have recently occurred within the military (i.e., revolutionary versus evolutionary). They also talk about such things as job assignments and coping. Many students find the results and the model insightful and useful.

Also at the Army War College, KAI is revisited as part of a Creative Thinking Advanced

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Course. The emphasis here is to highlight different ideas of what is creative and how adaptive solutions are often not adequately recognized as creative (e.g., only out of the box thinking is perceived as creative). They also examine how adaptive and innovative approaches are more closely matched with the differing requirements at various places in the problem solving and R&D process (e.g., innovation is probably more critical at the beginning of a research effort and then more adaptive types of activities predominate as the research progresses to development). The student reaction is quite positive. Finally, Dr Barber presents KAI to spouses as part of the Military Family Program, covering much of the same material with them. The reaction of the participants is very positive.

Mr. Stephen Harris, Organization for Academic Support, Maxwell AFB, used the KAI in a workshop for diversity training with a group of Civil Service managers. They found that A-I teaches that deep seated diversity can be mishandled or it can be handled to the great benefit of the group. As a result of insights gained from A-I Theory for appreciation of diversity, other diversities, instead of being ignored, can, with insight and effort, be turned to group advantage. The managers said that the KAI was better than the diversity training they were getting through Social Actions. They wanted the KAI brought into their organizations because "Now we understand what is going on with diversity."

### **Conclusion**

To enable us to fulfill the Air Force and DoD Mission, we must continually seek new concepts that can improve our ability to manage, to lead, and to work cooperatively. Adaption-Innovation (A-I) Theory holds that individuals have a preferred style of being creative, solving problems, making decisions, and dealing with change. The Kirton Adaption-Innovation Inventory (KAI) is an invaluable tool for opening dialogue and fostering understanding of different ways or styles of solving problems. The KAI is a highly reliable psychometric instrument that measures these style differences. It is our view, supported by research and experience, that the theory and the instrument provide a valuable tool to improve leadership in the Air Force and to improve the effectiveness of our teams, both management and process improvement.

We would like to thank Col Gail Arnott, Air War College, Dr Herb Barber, Army War College, Cmdr Alice Cahill, NC, USN, Mr. Stephen Harris, Organization for Academic Support, Maxwell AFB, and Col Mike McGee, National Defense University for generously sharing their experiences with the use of Adaption-Innovation Theory and the KAI.

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### **Capt Cassie B. Barlow, USAF, Ph.D.**

Capt Barlow is an AFROTC distinguished graduate from Georgetown University. At her first assignment, Mather AFB, she held the positions of Chief, Plans and Programs, Chief, Base Information Management and Wing Executive Officer before being selected for an AFIT tour at Rice University. Upon completion of her Ph.D. she was assigned to Armstrong Laboratory, Logistics Research Division at Wright-Patterson. She is presently a research psychologist in the laboratory and is the program manager for RAPTR.

### **Dr Allen Batteau, Ph.D.**

Dr. Batteau is the Principal Investigator for RAPTR. At Wayne State University, he is an Associate Professor of Anthropology and Director of the Business Anthropology Program. Prior to joining Wayne State, Dr. Batteau was the Director of Research at Wizdom Systems, Inc., a Congressional Fellow for the American Anthropological Association, and an Associate Professor at Michigan State University. Dr Batteau has lectured widely on the social and cultural aspects of technological innovation.



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# Are You Managing Your Organization's Rapid Change?

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## Abstract

Major shifts in the threats to U.S. security interests are causing Air Force (AF) organizations to undergo many changes. These alterations involve extensive mission modifications. The Lean Logistics program was one of the modifications and was initiated in order to streamline the logistics infrastructure while sustaining readiness and systems availability.

While the goal of these changes is more efficient and streamlined organizations and processes, they often decrease efficiency and are unsuccessful due to faulty process redesign or poor implementation. Sometimes organizations reorganize to show improvement without looking at their business processes or the implicit or explicit human issues involved in these changes. This can lead to increased dissatisfaction and productivity losses.

New technology is needed to enable AF decision-makers to better predict the impacts of incremental to radical changes to business processes. The Logistics Research Division of Armstrong Laboratory (AL/HRG) develops technologies to improve the logistics capabilities of the Air Force. One area of Laboratory interest is to develop a tool that will assist logisticians in making changes to their processes. This tool, entitled RAPTR (Readiness Assessment and Planning Tool Research), will be the first of its kind to ascertain productivity and cultural impacts of process changes and technology implementations before they are made. Managers will also be able to utilize a repository of past change efforts. Using this technology, Air Force Logistics agencies such as the Air Logistics Centers (ALCs) can achieve dramatic performance increases from process improvement and process change initiatives through better assessment and consideration of sociotechnical (human, organizational, cultural) issues.

## Background

Air Force logistics agencies such as the ALCs are engaging in process improvement or process change efforts with the goal of performance improvements throughout the logistics process. These process improvement efforts complement the Lean Logistics initiative to streamline the logistics infrastructure. The process improvement efforts must change the organization's culture in order to be successful (Wellins & Murphy, 1995). Cultural change is normally the most difficult aspect of process improvement. No improvement effort can succeed without the capacity to anticipate and manage the cultural and organizational consequences and impediments to implementing process changes.



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The cultural assessment research involved with the RAPTR effort will build upon the work performed by investigators at Wayne State University during the past 17 years (e.g. Batteau, 1995). Their research concentrates on organizational culture, business engineering, and process change. RAPTR is based on an Armstrong Laboratory Research and Development contract with three partners, Wayne State University, Wizdom Systems, Inc., and the Industrial Technology Institute. Field research for instantiating and calibrating cultural models and presentations is being conducted at Warner Robins Air Logistics Center, in cooperation with the Reengineering Directorate (WR-ALC/RE). Additional fieldwork is being conducted at Oklahoma City ALC and Ogden ALC. As part of the RAPTR development, a Field Demonstration will be conducted at WR-ALC to demonstrate the capabilities of the RAPTR tool.

RAPTR will produce a front-end, multi-purpose PC-based tool for integrating cultural, strategic, user-readiness issues, and previous project experience into process change scenarios. It will provide an assessment of these issues within an ALC or other aircraft maintenance environment, drawing on a knowledge base of data from previous projects and other sources. This knowledge will be accessible in a useful manner to reengineering, Lean Logistics, and other process change teams.

### **The System without RAPTR**

The *AS-IS* of process change scenarios within AFMC is characterized by small teams adapting published methods to local circumstances, *ad hoc* use of tools, and in some locations heavy reliance on consultants to guide the process change process. These teams typically work under aggressive schedules with tight deadlines for deliverables; often they have had little previous experience with process change. In this environment, teams look for tools that can enhance their productivity without requiring too great an effort to learn or master.

These tools vary in their accessibility to the user and their adaptability to multiple modeling and analysis techniques. The obvious conclusion to be drawn is that there is a large variety of tools, not all of which can or should be used on any given process change or Lean Logistics implementation project. Understanding which tools to use in any particular cultural environment is a major objective of RAPTR.

Additionally, there is little integration or data standardization among tool types. As a consequence, the process change team that wishes to take a comprehensive, integrated approach is required to assemble its own toolkit. That is, it is required to use a Computer Aided Software Engineering (CASE) tool that may be more appropriately intended for software development and code generation; or is required to transfer data across tool interfaces in ways that lower the quality or semantic content of the data (such as substituting a node list for an IDEF0 model). There is additionally no way to tailor (or expand) these tools to account for the cultural context of particular change efforts.

The current system fails not so much from a lack of tools, but from an inadequate, and inaccurate understanding of the scope of process redesign and implementation, which extends well beyond mere tools. Everywhere, organizational issues play a role in change processes. Inevitably, cultural factors upend or extend process change efforts. People make cultures, and organizations are cultures above all. Hence for process change (or any initiative) to succeed, it must proceed at

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some level with some understanding of the human side. It must be implemented as though people matter. The definition of culture is a system of shared understandings that provide a model of and an orientation for behavior (Schein, 1991). Within organizations, these shared understandings are typically negotiated among multiple interested parties, stakeholders, or constituencies.

A critical limitation of currently available tools is their lack of flexibility and usability. Most commercial off-the-shelf (COTS) process change tools require significant training, and/or are tailored to specific techniques. Some techniques are proprietary and require the retention of consultants to use. Support concepts vary widely for these tools. A commercially hardened tool like ABC FlowCharter requires only minimal training and support. On the other hand, some proprietary tools can be obtained exclusively by retaining the consulting firm that developed them.

Users of RAPTR will primarily be members of process change teams. Usually, these teams consist of expert civilians with civilian or military leadership. Few tools are designed to produce the high-level views expected by senior officers or civilian managers, and fewer still to provide integration between detailed and high-level views. As such, there does not exist a common environment for executives and business engineers to discuss process and design implementation projects.

As identified in the present research, the three major deficiencies of current process change tools are:

- Inflexibility
- Fragmentation
- Mechanistic outlook

Inflexibility means that the tools in use apply narrowly to specific contexts or specific methodologies. This prevents generalization to other organizations or situations. Additionally, over-reliance on consultants often creates inflexibility for an organization.

Fragmentation is the extreme opposite of inflexibility. Some toolsets may be considered too flexible, in that they permit the process change team to create numerous views of an organization that do not talk to each other. Although rigid, one-size-fits-all frameworks are undesirable, so too is the complete lack of a framework for the integrated planning of change.

The mechanistic outlook neglects cultural factors in change readiness. Although these factors can be assessed and managed, it requires a methodical approach. Further, the assessment of these “people issues” should be integrated into other views of the organization, including process views and strategic views. We judge that an assessment approach provides the optimum balance between local flexibility (adapting to local situations) and a uniform approach across multiple USAF components.

To address these three deficits, four capabilities have been identified for a new integrated process change and change management tool. These are:

1. Methods for organizational and process investigation allow the user to address the issue

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- of having a mechanistic outlook and to pay attention to the “people issues”.
  2. Assessment tools for examining organizational, cultural, and communication issues also addresses the issue of having a mechanistic outlook. A context-adaptive assessment would also address the issue of inflexibility.
  3. A capability for accumulating and maintaining knowledge on these subjects. This capability enhances the effectiveness of the other three capabilities by supporting learning scenarios as RAPTR accumulates project knowledge.
  4. Integration of diverse views on organizations and processes allows the user to overcome fragmentation issues located within the architecture.

## **The System with RAPTR**

A widely cited figure in the literature on process change is that approximately 70% of all process change projects fail usually from lack of management buy-in or due to cultural obstacles (Wellins & Murphy, 1995). Much of the failure stems from inadequate scoping or planning, including gaining and employing an understanding of how to manage the people-related aspects of change. RAPTR is intended to address this need by providing a front-end assessment of the cultural and organizational issues that affect process change and making these findings accessible in a form usable for project planning.

AFMC process change and Lean Logistics teams are asked by their command to plan and implement breakthrough improvements in logistics operations. These teams develop change plans for their organizations, at times in the face of cultural resistance. They rely on robust productivity tools to meet their aggressive schedules.

The RAPTR tool will help AFMC process change and Lean Logistics teams by supporting the planning of organizational change and by providing support in meeting the teams’ aggressive project schedules. One of the system’s unique capabilities will be in providing an on-time and on-target assessment of cultural issues that impact business processes.

The tool will accommodate the various tools needed for process change (such as IDEF modeling tools and repositories, groupware, simulation packages, project planning software, and productivity tools such as word processing and spreadsheets) in an effective and efficient manner through a combination of system integration and system interfaces. The RAPTR system will contain a set of open architecture interfaces that can pass information to and from standard business engineering tools. This integration will enable a configured RAPTR to support locally tailored process change scenarios and tool suites.

Additionally, the RAPTR tool will be web-enabled, permitting distributed collaboration through standard web browsers. All tools in the RAPTR tool kit will be accessible through a standard web interface, either as integral parts of the system or as helper applications that are activated to perform specific tasks or analyses.

As illustrated in Figure 1, RAPTR ties together three major functions critical to process change projects. These are:

- Comprehensive assessment of process change issues in an organization
- Identification and support of tools and methods
- Access to knowledge and lessons learned from previous projects

### *User Perspective of **RAPTR** Capabilities*

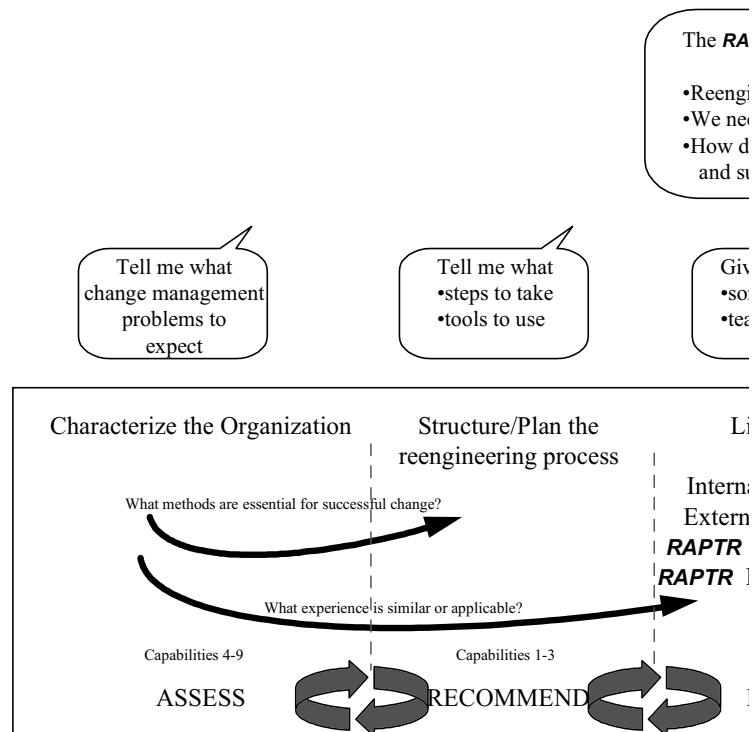


Figure 1 — User Perspective on Capabilities

Driving the overall RAPTR concept is the first of these: the comprehensive and context-specific assessment. Within any organization there will be multiple issues that are unique to the organization (i.e., technology, structure, communication, culture, and strategy). These are all baseline issues for any process change project. Further, they are systematically related (e.g., steps taken to improve user readiness, a cultural issue, can draw on or may affect baseline states in technology, structure, communication, or strategy). Thus only by integrating multiple views can a tool both identify the baseline issues and recommend remedial steps.

The RAPTR system will have twelve major capabilities which are organized by three functions. The RAPTR operational concept envisions an iterative relationship between the first two of these. A high-level description of the organization will provide guidance to project planning, which in turn will structure a plan including a more detailed assessment. The capabilities are:

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### **Structure/Plan the process change effort**

1. Reference Model of Reengineering.
2. Reengineering Workflow Manager (RWFm), with capability, for developing project plans and tracking deliverables.
3. A design capability for assisting teams in designing the *TO-BE* process.

### **Characterize the organization**

4. Modeling and characterization of business processes (including logistics processes).
5. Identification and characterization of the goals and objectives of an organization.
6. Characterization of an organization.
7. Assessment of an organization's *AS-IS* and *TO-BE* technology.
8. Assessment of an organization's communication environment.
9. Assessment of an organization's culture.

### **Access useful knowledge**

10. Team resources for process change teams.
11. A Designers' Notebook for accumulating project knowledge.
12. A Notebook Library for accessing knowledge from previous projects.

## **RAPTR's Impacts**

RAPTR will be designed to meet the needs of the team re-designing and planning the implementation processes. One aspect of the field research will concentrate on exploring the needs of the process re-design planning team. It is expected that there will be a range of experiences characterizing the RAPTR user. RAPTR users may be senior managers with extensive reengineering background or non-managerial employees with no previous experience in process re-design and process change issues.

RAPTR intends to impact the current process change and change management operations by addressing unfilled user needs. Current user needs include:

- *Formalized training for change agents*
- *A mechanism for sharing process change initiative efforts across the ALCs*
- *A mechanism for sharing metrics across ALCs*
- *A mechanism for creating a historical "corporate memory"*
- *A centralized mechanism for storing process models*
- *A standardized methodology and standardized tools-set for process change*
- *A guide to planning for "people issues" and developing process change strategies*
- *A standardized assessment for understanding the organization's technology environment, includ-*

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*ing computer hardware, applications, skills, and support*

- *Standardized and shared workflow tools for driving the design and implementation of change projects*
- *A resource for managing the knowledge accrued from multiple and ongoing process change efforts*

By meeting the above needs, the effectiveness and timeliness of organizing and implementing change projects should be dramatically increased.

Process change teams can be expected to operate in a turbulent organizational environment where new command initiatives may redirect the focus of the team. Additional turbulence is created as team members, by design, are on rotation. It is not the intent of RAPTR to reorganize process change efforts or restructure process change organizations. Rather, a benefit of RAPTR is to empower the process change teams by assisting them in doing their jobs better regardless of environmental factors. RAPTR, with its uniform interface and common repository of process change experience, will provide the one constant in a turbulent change management environment. With proper design, RAPTR will provide the core resource for current and future process change. Because we anticipate RAPTR to function as a process change training tool, the use of RAPTR should also facilitate training and indoctrination of new team members.

## Summary

The benefits of RAPTR are improvements in the planning, execution, and management of process change projects. Using RAPTR, process change teams will:

- Have greater visibility into critical issues such as readiness and culture
- Have access to proven solutions for these issues
- Have access to the experience of previous projects
- More readily solve some of the chronic challenges of change efforts, such as scoping, tool selection, documentation, and team preparation.

By removing, mitigating, or minimizing these challenges, RAPTR is intended to provide substantial advantages in improving organizational flexibility and effectiveness.

RAPTR makes a presumption that change efforts will enable the US Air Force to better accomplish its mission of providing air superiority, in a time of declining resources, and rapidly changing threats and technological opportunities. Stated another way, RAPTR makes no judgment regarding the ultimate value of change efforts. Instead, RAPTR assumes that a healthy organization is one that is ready to adapt to changing environmental circumstances, as threats and opportunities evolve.

The RAPTR team will develop a cost-benefit model to measure the overall benefits of RAPTR. Some of the lower-level measures that this model might include, and which could be collected both retroactively on past projects and currently on RAPTR-supported projects through the Designers Notebook, might include:

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- Number of times previous projects were accessed
  - Number of times lessons learned were accessed, and used
  - Project schedule performance
  - Follow-through to implementation
  - Career tracks of project managers and sponsors

The last of these may deserve some elaboration. *The* most compelling data on the success of a project might be the next assignment of the project sponsor or manager. This could be the final entry in the designers' notebook before a project was closed out.

RAPTR is conceptualized such that its benefit will grow over time. The first users of RAPTR will have only minimal access to projects through the notebook library; as this library is populated, the benefits of RAPTR will grow.

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CMSgt Sandy Bohlander, Debbie Smallwood, and Capt Steve Rolin's 14 combined years of quality has enabled them to be instrumental in changing the AFPC culture. Highlights include criteria training, metrics development, USA, customer focus and satisfaction index and rewards and recognition.

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# **“Plain English, Please” version of the 1997 Performance Excellence Criteria in Picture Format**

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## **Abstract**

All organizations are ready, willing and most are able to institutionalize organizational Performance Excellence, formally known as Quality Air Force (QAF). Unfortunately, the Criteria has a tendency to lend itself to interpretation by “Expert” Consultants only! The average working person breaks into a cold sweat whenever Unit Self Assessment (USA) writing time rolls around, or when the Quality and Manpower people walk into the room to discuss key processes or metrics. We, at the Air Force Personnel Center, have designed a “Plain English, Please” picture format version of the Organizational Performance Criteria. This template is a simple, fill in the blank form that takes the Expert out of the Criteria and give the understanding back to the average worker! A common fallacy, among Air Force members, is that quality does not lend itself to what we do, however, with this “Fill in the Blank” tool, individuals can see for themselves how easy it is to operationalize quality in their daily work. Individuals can more effectively track and monitor their own processes, show ownership for their successes, and operationalize Performance Excellence!

## **Paper Text**

We all know that it takes a multitude of people several months to write the USA and complete the assessment process. In most cases, once the assessment is over, recommendations are considered and implemented. Once implemented, people tend to lose focus. In essence, we cram for the final, take the test, and do a brain dump until the next USA. We wanted to try a different approach when preparing for our USA. We wanted to change the mindset within AFPC and show people that quality was not a separate job or a one time event. We were determined to show people how to overlay their processes with the Organizational Performance Criteria. As stated earlier, we accomplished this goal with a “Plain English, Please” template we derived from AFI 90-501 Air Force Organizational Performance Criteria. This template simplified the process and made people believers that this “stuff” was not hard to understand - - the average person really could make sense of it all.

The picture in Figure 1 shows the template used to operationalize and deploy performance excellence throughout the Center. This format, coupled with certain questions, can painlessly guide a process owner through the Management areas of the criteria. Since we are using “their” process and not a theoretical process, people more readily understand the correlation. This “Plain English, Please” format is useful at any level within an organization and can result in phenomenal breakthroughs!

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Fig. 1: “Plain English, Please” format of Categories 3, 5, 6, and 7 for Key Process Overlay.

Once we received the list of Key Processes for the Personnel Center from the Directors we set out to work side by side with the process owners. We introduced, to the process owners, the “Plain English, Please” template. To best illustrate the use of the form, we began our roundtable discussion with a train analogy. The engine of the train constitutes the customer, the passenger compartment the process, the passengers in the compartment represent the end user of the product/service, and, finally, the caboose, is the feedback mechanism. The Waystation is the supplier and the switching station is the measurement. We found people very receptive to this analogy because we didn’t use any “Quality” jargon and didn’t cram rules and regulations down their throats. We had a very realistic but simple approach on how people could incorporate quality into their everyday life. Initially, we tested the template within our own Directorate, Customer Assistance. Each week, we visited a work section and showed them how to use the template, followed by a review of the completed document several days later. By allowing people to work the template on their own, they gained a greater understanding of the Performance Criteria. Armed with this new insight, the process owners briefed their peers which greatly enhanced everyone’s learning curve. In retrospect, this approach accomplished 3 goals, it indoctrinated people on how to apply Quality through actual application, it offered the Division Chiefs a new understanding of their process, and finally it provided new opportunities for feedback not previously considered. After completing the template and briefing the rest of the staff, the final product was placed on a common server for the intent of centralizing all USA data collection.

Our Director was so pleased with the results that he exported the idea to the other Directors. Almost immediately, throughout AFPC, we were inundated with requests for help. This template was embraced at all levels because it enabled and empowered the average worker and has become the AFPC standard!

We have shared with you our success story, now let’s walk you through the template and add to your arsenal in your fight to operationalize Quality.

### **STEP 1: The Process**

In order to identify the process, we have to determine what is the most important thing they do on a daily basis. We stimulate their thought process by asking them these simple, but direct questions:

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Process
(1)
Passenger Compartment

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Fig. 1a

1. Why do you come to work everyday?
2. What is the most important job you do?

3. What is it that you do, that if you didn't do for 24 hours, someone would notice immediately?
4. What is it that you do that if it didn't get done would get you fired?

By using these probing questions, we help identify their Key Process. Once identified, place that process in the Process box (Fig 1a). During the course of the discussion, new thoughts or ideas may surface, so write all entries in pencil! The template will slowly guide them to the correct answer - - that is the beauty of the "Plain English, Please" template.

**Step 2: The Customer**

To determine which customer we are talking about, we relate back to the train scenario. The customer who sets the requirement is the engine pulling the train, and the customer who uses the product is the passenger. Process owners usually have the most difficulty understanding this distinction. This is where you will spend the bulk of your time, however, it is the most valuable use of your time, because the rest of the template hinges on this area. To determine the customer(s), ask these questions:

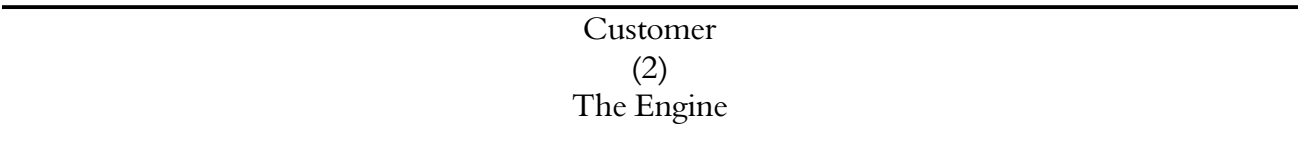


Fig. 2

1. Who set the requirement(s) for you to do your job everyday?
2. Where do you go for clarification on your job?
3. Negative feedback from which group will cause you to make IMMEDIATE changes to the process?
4. Who are the individuals directly impacted by what you do?
5. Which customers do you interact with daily?

Questions 1 through 4 should lead the process owner to identify the "requirement setter" and questions 4 and 5 should tell them who actually uses the product or service they produce. Although these questions appear simple, they usually lead to thought provoking discussions.

**Step 3: Feedback**

Once the customer is identified, determine what type of feedback is used to gauge their satisfaction level. We want the process owner to think of all avenues of feedback whether formal, informal, documented or not documented. This is a great opportunity to brainstorm different methods of interaction. It's important to solicit feedback from all customers because their requirements are different. The methods used to gain customer satisfaction /dissatisfaction information from either the "requirement setter" customer or the "user" customer could be the same but not necessarily so.. List everything!

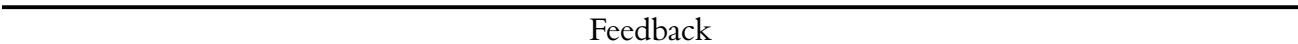


Fig. 3

#### Step 4 Supplier

In our train scenario, the supplier is the Waystation which provides the fuel. We use this analogy to help people determine who it is that provides the fuel for them to stay in business (the “Fuel” supplied could be information, guidance, etc.). Brainstorm, write down everything! To determine the supplier(s), ask these questions:

1. What is “IT” that you need to get your job done?  
(primary supplier product).
2. Who provides “IT” to you?  
(primary supplier).

Once you have identified the suppliers, it is now time to discuss how you manage your supplier relationship. To determine supplier relationship management, ask these questions:

1. What type of regular communication do you have with your primary suppliers?
2. What means or method do you use to relay your requirements to them?
3. How do you make your primary suppliers a part of your team?

Notice the supplier block ask for supplier feedback information similar to the customer feedback in Step 2. The feedback mechanism is listed in Block 4, but the measurement for supplier feedback is listed in Step 5, Block 5. ALL measurements for every part of the process is listed in Block 5.. To determine supplier feedback measures, ask these questions:

1. How do you provide feedback to the supplier, both positive and negative?
2. What avenues do you provide to the supplier to solicit feedback to you?

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Supplier  
The Waystation  
  
Supplier Feedback  
(4)

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Fig. 4

#### Step 5 and 6: Measurement and Areas for Improvement

Next to the identification of the Customer in Step 5, the Measurement block is the eliminator. It acts as the sifter of information. If the process owner is unsure of exactly what is important, Step

5 should clear the fog! It is also important to have “In” and “End” metrics. For example, if you have a process from A to Z, an “End” metric measures the “Z”. An “In” metrics measures pieces of the whole process at different points between A and Z. Questions 1 through 3 helps the process owner tie feedback to measurement. Question 4 and 5, is where the rubber meets the road. The answer to these questions will lead the process owner directly to the Areas for Improvement.

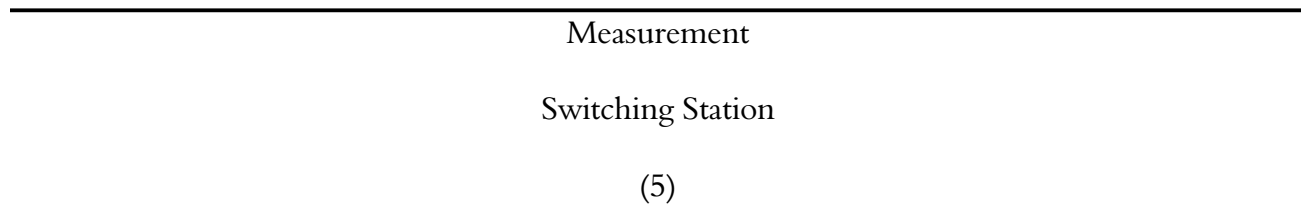


Fig. 5

1. For every feedback mechanism identified in Step 3, can you link a measurement device to it?
2. If a measurement device cannot be linked, can some of the feedback mechanisms be consolidated?
3. What measurement device do you currently have that is not linked to a feedback mechanism?

To ensure that you cover all of the areas called for in Category 7 of AFI 90-501, link all measurement devices in block 5 to these categories:

- (a) Customer Satisfaction
- (b) Mission performance
- (c) Unit efficiency
- (d) Human resource
- (e) Supplier quality
- (f) Regulatory results.

4. Do you have any measurement devices that do not fall into these categories?
5. Can all of your measurements answer these questions?

- What decisions have you made as a result of reviewing this data?
- What improvements have you made as result of reviewing this data?
- Is this measure an “In-process” measure or an “End-process” measure?
- For all “End-process” measures do you have “in-process” measures or indicators?
- For all of your measures do you have goals or standards? If so, how did you develop them?

If the process owner is having trouble answering the above questions, have them peel the onion back on each of their measurements. By peeling it back one or two layers, they may find that the reason they are having trouble is because they are measuring too soon or too late in the process. They may even be measuring a process for which they are not the process owner. They will only make this discovery if they start the peeling process. After you have completed this exercise, your Areas for Improvement should be obvious.

By utilizing this approach, we turned a very painful situation into a positive learning experience from which everyone benefits. To improve our process, we critiqued our customers. The results indicated that we had succeeded in our goal — we had increased understanding of the Organiza-

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tional Performance criteria. The template helped identify areas for improvement, increased individual confidence level in using the criteria, and broadened their awareness of the need for different types of measures. Bottom line is the Performance Excellence criteria should not be for “Experts” only! Every effort should be made to make it as user friendly as possible, and the “Plain English, Please” template accomplished this for the Personnel Center.

People are not impressed with your vast array of knowledge in Quality. What people are impressed with is your ability to tell them in simplest terms what is required of them, and how this process can make their lives easier. Making complicated processes simple is the trademark of people like Bill Gates!! He took complicated computer operations, made it so simple that the average person on the street could operate a computer without fear. That is what we’ve done with our picture format. It produces a method whereby the average worker can use it to achieve Performance Excellence without the extra burden of having to become a Consultant Expert!



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### **Monique Botting**

Monique Botting is Chief of the Benefits and Entitlements Services in the Directorate of Civilian Personnel Operations at Headquarters Air Force Personnel Center, Randolph Air Force Base, Texas. Monique began her Air Force civilian personnel management career in 1985 as a training specialist. She has held assignments in classification, staffing, employee and labor management relations. Prior to assignment to the Air Force Personnel Center, she was assigned to Headquarters Air Force, Directorate of Civilian Personnel, Civilian Policy Division (Pentagon) and worked the DoD Priority Placement Program, career program management, managerial competencies, and other staffing programs. She transferred to the Personnel Center in June 1995, and has primary responsibility for regionalizing benefits services for the entire Air Force.

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## ***BENEFITS AND ENTITLEMENTS SERVICE***

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### ***The Challenge***

The Air Force is reducing by 50 percent the number of personnel in its civilian human resource (HR) offices by FY00. This is coming at a time when customers are demanding better service, shorter response times and up-to-date answers to their service questions. Hence, the Air Force faces two critical challenges: 1) reducing support staffs and customer service costs, and 2) sustaining high-quality customer service. To meet these challenges, it was necessary to find ways to make customer service operations more efficient and productive.

### ***The Approach***

The reduced budgets and the emphasis and directives of the National Performance Review (NPR) created a business environment that encouraged the Department of Defense (DoD) and the Air Force to seek changes in its HR organization and services. DoD issued a series of directives for military Components and Defense Agencies to regionalize HR operations and provided initial “seed” money to attain that objective. In July 1994, the Air Force Chief of Staff approved the establishment of a single center for civilian HR servicing at Randolph Air Force Base, San Antonio, Texas. This center was to support both military and civilian HR operations from the one facility. The Air Force is the only DoD agency of its size — servicing a total of 135,000 civilian employees (located at 92 sites stateside and overseas) by mid-1999 — to make such a move.

The Air Force established a number of marketing and reengineering teams to review its business practices and to suggest improvements for use in regional operations. These PALACE Compass Marketing and Reengineering Teams (PC-MARTs) thoroughly analyzed the resources required to operate in a regional environment. Those analyses took into consideration the economies of scale available through regionalization and the anticipated efficiencies to be gained by implementing existing DoD Functional Process Improvements (FPIs). Based on the results of the PC-MART’s analyses, Air Force HR directors approved the recommendations to regionalize the following federal benefits programs:

- “ Federal Employees’ Group Life Insurance (FEGLI)
- “ Federal Employees’ Health Benefits (FEHB)
- “ Civil Service Retirement System (CSRS)
- “ Federal Employees’ Retirement System (FERS)
- “ Thrift Savings Plan (TSP)
- “ Survivor Benefits.

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The PC-MARTs provided the leader of the Air Force's benefits services implementation team with the concept of delivering regionalized services using a call center approach. In response, the team leader began investigating the types of technologies used in call centers, particularly those supporting HR/benefits applications. This investigation resulted in the Air Force developing its vision of an automated benefits delivery system. In that system, employees would obtain program information on federal benefits and entitlements to assist them in making career decisions. They would also be able to access personal coverage information and have a tool for changing their benefits coverage without the need to process hard-copy personnel forms and without the need to talk to a benefits counselor.

In researching the industry, the implementation team learned that the call center model is one of the fastest growing technological enterprises in the private sector. A great increase in call centers began about 10 years ago and the number of call centers continues to grow today at approximately 25 percent per year. Private sector experience shows that call centers can be implemented relatively quickly and inexpensively, while yielding increased efficiencies almost overnight. Although call center technologies have been in operation for a while and are proven to work in business applications, it is only recently being used to support centralized HR servicing. Application of these technologies in the federal government has also been minimal and on a small-scale.

This call center concept of operation is detailed in the *United States Air Force Personnel Center, Civilian Benefits and Entitlements Project Plan*. That plan describes the organization, activities, and responsibilities of the new Benefits and Entitlements Service Team (BEST) and the new automated benefits delivery system, including structure, hardware and software requirements, and testing and implementation schedules.

### ***Policy & Operational Changes***

The Air Force had to secure support for the automation initiative from a number of internal Air Force organizations, and from external agencies, specifically DoD Civilian Personnel Management Service (CPMS), DoD Finance and Accounting Services (DFAS), Office of Personnel Management (OPM), Federal Retirement Thrift Investment Board (the Board), and National Finance Center. Each of these organizations have control over some portion of the federal government benefits and entitlements programs and processes — either for legal, regulatory or policy oversight, or from an operational, procedural and/or interface perspective. Although these agencies have worked through varying degrees of reengineering, streamlining and automation initiatives, the Air Force's total benefits delivery service approach was the most radically reengineered approach ever proposed. To make the vision a reality requires greater flexibility in how agencies administer the federal benefits programs and requires customers to become more self-sufficient in managing their benefits. Air Force developed the concept of operations with the objective to empower customers to conduct their own HR business and to significantly reduce the HR staff's role in controlling or monitoring those activities/processes. This required changing HR paradigms and customer service expectations.

Major initiatives that were or are being worked through the various agencies identified above include:

- “ Employee electronic signatures using a combined Social Security Account Number

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(SSAN) and a Personal Identification Number (PIN) for electronic processing of benefits transactions.

- .. Agency electronic signatures for certification and authentication of electronically processed benefits transactions.
- .. Providing employee copies of personnel documents, on demand.
- .. Elimination and/or combining forms in order to reduce the number of forms in use.
- .. Automating personnel forms to facilitate automating the processing of these forms.
- .. Elimination of procedural and operational program administration requirements (non-value added requirements, duplicative work, etc.).
- .. Providing benefits program publicity through electronic means, e.g., Home Page, e-mail, fax back on demand, program scripting on the automated system, referral to other sources (e.g., OPM and the Board's Web sites), etc.
- .. Electronic data exchange between Air Force and external agencies such as health insurance carriers, DFAS servicing regions, etc.
- .. Enhancements to the DoD Leave and Earnings Statement (LES).
- .. Increased interface between the Defense Civilian Personnel Data System (DCPDS) and the Defense Civilian Payroll System (DCPS).
- .. Additional personnel data capture requirements for DCPDS.
- .. Integration of the technology with the modernized DoD personnel data system.

Throughout the planning, development and implementation process, Air Force raised an interest within DoD (e.g., Army, Navy) and external to DoD, with agencies like the Postal Service, the Internal Revenue Service, Department of Agriculture, Veterans Affairs, Department of Labor, etc., who are all looking for solutions to downsizing, centralizing, and automating. Support gained from these civilian agencies has been instrumental in gaining assistance for the approvals necessary to proceed.

### ***How It Works***

For personal and general information, a customer from one of the participating bases calls the Air Force Personnel Center's BEST's toll-free number and inputs his/her SSAN and PIN to access the automated benefits delivery system. The customer selects, for example, "life insurance" from the

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main menu. The system retrieves the customer's personal life insurance information and voices both personal as well as general program information. To make Open Season and out-of-cycle benefits transactions, the customer chooses the menu item for transaction processing and, using prompts, conducts the transaction. He/she can make an initial enrollment, change an existing enrollment, or cancel enrollment altogether. There are no forms to read, complete and submit — a process which averaged at least two trips to the local HR office and approximately 45 minutes for customers. In addition, for each transaction it took an average of 30 minutes for an HR clerk to process and file it. These activities have been reduced to a 10 minute process — the action is submitted directly to the DCPDS, automatically flows to the payroll office, is electronically filed in the customer's official personnel record, and is verified to the customer through their bi-weekly DoD Leave and Earning Statements (LES). The customer can then reenter the system after having conducted a benefits transaction to verify that the transaction is pending, when it will be effective, and reconfirm they want that transaction to process.

Empowering customers to process their own transactions directly to DCPDS increases the accuracy of that customer's master personnel data record and reduces the need for benefits counselors to research problems and take corrective action. Database integrity and currency improves due to the elimination of the manual keystroke process used to update DCPDS the traditional manner.

### ***System Design and Components***

The implementation team, working with a number of different contractors, drafted the system design document and determined the implementation schedule. The design document depicts how the automated delivery system operates in terms of menu structure/layout, scripts and voiced text, and edit and processing routines that control activity in the system. The design document takes into account the legal, regulatory and procedural requirements published by government agencies who control the federal government employees' benefits and entitlements programs. It took approximately six months to develop and only eight months to field the first phase of the system. The design document is being enhanced as additional requirements are identified.

The Air Force's automated benefits delivery system consists of six key features: Automatic Call Distribution (ACD); Computer-Telephony Integration (CTI); Interactive Voice Response System (IVRS); knowledge-based/expert systems software; customer and counselor access to existing and newly created databases; and integration with other Air Force initiatives and off-the-shelf equipment and software applications.

- “ **ACD** ensures a natural flow of communication between customers and the call center, which enables the benefits service team to perform with maximum efficiency and customers to benefit from enhanced service and support. ACD manages the flow of inbound, outbound, or combined customer communication by distributing incoming calls among benefits counselors so that each counselor handles an equitable share of the load. As a result, the benefits counselor is able to handle more calls and callers/customers have the best chance of being served quickly. ACD can also be programmed to direct certain types of calls to specific counselors who are skilled in a particular subject matter or program area. This feature ensures the caller is put in contact with the counselor most experienced to answer his/her questions.

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- “ **CTI** is an emerging technology created by the convergence of computers; switches; telephones; and media technologies, such as voice, facsimile, text-to-speech, video, and automatic speech recognition. It allows the voice communication and associated data elements to travel together throughout an organization. CTI “untaps” human resources by: 1) increasing timely access to information; 2) sharing current and new information; 3) more effectively communicating and presenting that information; and 4) allowing more timely action or response to information. As a result, benefits counselors can receive a phone call along with other pertinent information associated with the caller, such as call history and benefits portfolio, which together ensures the telephone call is as efficient and effective as possible at the onset. A counselor who is unable to assist a particular caller can route the call and personal data screen to a more experienced counselor.
  - “ **IVRS** uses scripted and recorded messages to answer telephone calls and respond to repetitive, transaction-based questions. Using touch-tone phones, customers can access information on specific benefits coverage and then perform simple transactions from their workstation or home 24 hours a day, 7 days a week, including holidays. The technology used in the Air Force benefits delivery system is a software platform for interactive services — offering interactive voice response, workflow, fax and eventually Web capabilities to automate routine administrative tasks. The software application enables the benefits service team to achieve superior service and productivity through faster, more efficient communication of information. One industry standard cited in the call center literature is the 80/20 rule — 80 percent of all call activity is handled by an automated system while the remaining 20 percent transfers to a customer service agent for assistance. Although few call centers attain this degree of automation, the Air Force’s implementation team uses this rule when monitoring efficiencies of the current system and planning the automation of future services.
  - “ **Knowledge-Based/Expert System.** The components of the expert system include a benefits program knowledge base, developed internally by the benefits service team, and software that perform inferences on the knowledge and communicates answers to counselor’s questions — as the counselor communicates with the customer. This tool optimizes telephone servicing in that it: 1) centrally stores personnel data for multiple access; 2) improves communications among the benefits service team and between the team and its customers; 3) provides simple problem solving assistance to the benefits counselors; 4) contains a benefits knowledge-based problem-solving database for universal access; and 5) improves reporting and analysis in the areas of volume of calls, nature of calls, and distribution of workload. Through the use of this tool, customers can be assured that anyone they speak to on the benefits service team is able to give them fast, accurate information on the status of their inquiry, and quick resolution of their problem. This tool is used in conjunction with other automated regulatory counseling tools developed by the Office of Personnel Management (OPM), the Federal Retirement Thrift Investment Board (the Board), and federal personnel regulatory guidance automated by private firms.
  - “ **Database access.** With on-line access to databases, customers and benefits counselors are able to provide specific information related to a customer’s benefits portfolio. If a cus-

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tomers make a change in benefits coverage, the system automatically captures, stores, and processes the changes. The customer can then verify later that there was an action processed or is pending. If a customer, however, wishes to speak to a benefits counselor, the counselor will have database tools, including screen-pops (CTI feature), decision trees, automated regulatory and legal materials, call histories, and electronic official personnel folder, to assist in answering the questions.

- “ ***Integrated approach.*** An integrated approach to system design, development, and deployment has been key to the Air Force achieving additional efficiencies. The Air Force not only looked to integrate the five major components listed above, but ensured that newly developed personnel applications and off-the-shelf software and equipment (e.g., the electronic official personnel folder, facsimile server, and retirement annuity estimator application) were fully integrated. The Air Force’s future plans include integrating its system with the Internet (Web) and using personal computer-based applications that link customers and their personal computers with benefits counselors at the Air Force Personnel Center.

## ***Marketing***

The Air Force’s challenge was not only to develop new ways to deliver HR services in a long-distance environment, but to educate customers about the realities of a down-sized HR staff and the new business processes that are designed to function in a regional environment. This required changes in customer expectations which can be influenced through an extensive marketing campaign. Since the automated benefits delivery system uses familiar technologies, customers, in general, have minimal difficulty accepting the new business process and transitioning to the new automated benefits delivery system because it closely mirrors how they receive information and conduct business transactions in their personal lives today (e.g., banking, insurance, claims processing, and retail sales). Customers are quickly becoming accustomed to accessing information anytime and anywhere they choose, and they are demanding this same type of convenience and self-service in the federal government.

Marketing the new business process has taken a number of different forms: 1) marketing materials that explain the new business process and what services are available through the automated system, including a Question & Answer brochure that explains how employees use the system; 2) placing marketing and benefits program information on the Directorate Home Page on the Web; 3) management and employee briefings conducted at each base prior to transition, where the participation rate is averaging 65 percent; 4) benefits and entitlements bi-weekly service delivery updates to local HR offices; and 5) personal employee newsletters.

## ***The Test***

On 20 November 1996, the new automated benefits delivery system went ***live*** at nine Air Force test bases in time for the FEHB and TSP Open Seasons. Participating test bases were Moody AFB, GA, Arnold AFB, TN, Cannon AFB, NM, Dyess AFB, TX, Grand Forks AFB, ND, Little Rock AFB, AR, Onizuka AFB, CA, Goodfellow AFB, TX and General Mitchell IA/ARS, WI. The complete deployment of the “baseline” system is set for deployment in phases, and testing will continue through January 1998, with the test sites and population increasing as the Air Force Personnel Center assumes servicing responsibilities for additional bases.



**Phase I** of the new automated benefits delivery system, test base employees made their Open Season elections electronically using touch-tone phones. The system provides callers with general and personal health benefits, life insurance, Thrift Savings Plan, retirement, and survivor benefits information on demand. Call activity during Phase I has been extensive and numerous transactions have processed direct to DCPDS.

Call & Transaction Activity			
IVRS Calls	Counselor Calls	IVRS Updates	Manual Updates
17,858	5,653	514	783
<b>Period:</b> 17 November 1996 through 18 May 1997			
<b>Serviced Population:</b> 18,000 (23 Air Force Installations)			

Of the total call activity (17,858) — 32 percent of employee calls were assisted by a counselor. This human intervention will remain fairly constant through FY99 as the Air Force Personnel Center continues to increase servicing population and employees unfamiliar with the new system need more personal assistance from benefits counselors. Of the total benefits transactions submitted to DCPDS (1,297) — 40 percent were processed directly by the customers, and 60 percent were processed by the benefits counselor using the traditional DCPDS update method. The Air Force expects a reduction in calls transferring to benefits counselors as customers adjust to the new business process, and an increase in automatic transactions as more automation is fielded in subsequent phases.

**Phase II** simulation testing began 2 April 1997 and the additional enhancements were deployed 15 May 1997. Phase II further automates the benefits programs — lessens the need for benefits counselor intervention and increases efficiencies. Phase II provides employees the ability to electronically process out-of-cycle and in-processing health benefits and life insurance transactions. Other significant manual workload performed by benefits counselors is computing retirement annuity estimates for employees who are making retirement plans or who are making career planning decisions. This makes up approximately 55 percent of the manual processing work performed by the benefits service team. This workload will increase as the Air Force continues to downsize its civilian workforce. Although an off-the-shelf software application actually computes the estimate, it requires the benefits counselor to conduct an in-depth review of the official personnel folder to determine the correct information for the software. This process takes an average of 45 minutes for a straightforward estimate, and can take up to three hours for a very complicated retirement estimate. Phase II automates this process in a number of different ways; the most significant of which allows customers the ability to request retirement annuity estimates on demand through the IVRS, with some real-time interaction. The IVRS produces a basic estimate in about three minutes. This feature, along with the additional functionality in Phase II, puts the Air Force closer to achieving 100 percent automation of the benefits programs.

Throughout the entire testing period, the benefits service team performs a 100 percent quality control review of the system; focusing on the accuracy of the transactions processed by customers and ensuring the required information was submitted timely and correctly to DCPDS, payroll, health insurance carriers, and the National Finance Center. This commitment to quality includes surveying customers who have accessed the system for feedback on whether the system is responsive to their needs, whether it is user-friendly, whether the user experienced technical difficulties, and to

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gain insight into what other types of HR services customers would like to see in the system. Currently, customer satisfaction measurement is done in three ways: 1) follow-up phone contact; 2) form survey; and 3) ad hoc inquiries when responding to Home Page inquiries from customers.

**Phase III** will be developed and deployed during the remainder of FY 97. These will include call flow and editing changes, rescripting, and other minor enhancements in order to complete the baseline system. In FY 98, development efforts will focus on integrating the automated benefits service delivery system into the DoD modernized personnel data system. Phase III will also look at the need to reengineer the retirement application process and look to PC-based benefits applications.

### ***Benefits Service Delivery Cost Study***

The Air Force Personnel Center contracted with Logistics Management Institute (LMI) to perform a cost analysis of the savings the Air Force would realize by reengineering the benefits delivery service. The report entitled *Benefits Center Cost Analysis (AF505LN2)* was published in July 1996. The analysts considered three different costs in the analysis - investment, operations, and disposal. The study compared the costs associated with providing benefits services to customers using the traditional manual method versus the costs to deliver the services using the proposed call center concept of operations. However, the scope of the study was limited in that it identified a lower number of HR staff/full-time equivalents (FTEs) performing benefits work in the field, and it only addressed the costs associated with processing benefits changes to DCPDS. In determining costs for the reengineered process, LMI also consulted Texas Instruments, Inc., where a similar call center operation was implemented to support their centralized benefits servicing.

The LMI study reflects a \$2 million dollar savings through the five-year implementation period (FY01), and \$900,000 annually thereafter. With a more accurate assessment of the Air Force's skills database, the Air Force projects cost savings of \$3.6 million dollars due to an 84% reduction in HR FTEs through the implementation period. There are numerous other cost savings/avoidance that cannot easily be measured. For example, the automated benefits delivery system allows employees to conduct personnel business at their work-site or at home, thus increasing employee productivity on the job by keeping employee on the job; costs savings associated with reducing the transaction processing time for both the customer and the HR staff from 75 minutes to 10 minutes.

### ***Summary***

A sound concept, a thoroughly developed approach, and an ambitious implementation timeline helped the Air Force establish a method for its civilian workforce to take responsibility for managing their benefits and entitlements, and a system that allows customers to better understand how their personnel decisions affect them and their families. As customers become more involved in their benefits programs and as they are directed to the automated benefits service delivery system for assistance, local HR offices will be relieved of many customer-assistance responsibilities, which should enable them to provide better service in other HR program areas.

The vision statement for the Directorate of Civilian Personnel Operations is "The directorate is a fluid, integrated, operating organization that fosters innovation and manages change in an open environment, always striving to deliver better services at lower cost". Two of the organization's goals

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for attaining this vision are “To provide quality benefits and entitlements servicing for the Air Force and to work towards continual service improvement and cost reductions”. Reengineering through use of technology is not an end in itself, but a means to achieving the Directorate’s goals and vision.

The regional service approach and technical solution taken by Air Force mirrors private industry and supports reengineered processes. The automated benefits delivery system will continue to be enhanced as technologies are refined and new ones emerge, and as customer service demands evolve. The initial investment costs will be offset throughout the implementation period and beyond with significant savings in HR personnel. The Air Force continues to develop plans to optimize on the technology investment to ensure it meets the needs of its customers well into the next century.

***Citations:***

*USAF Personnel Center, Civilian Benefits & Entitlements Project Plan, July 1996*

*Benefits Center Cost Analysis (AF505LN2), Logistics Management Institute, February 1996*

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### **Tech. Sgt. Derek T. Boyle**

TSgt Derek T. Boyle earned his AAS degree in Instructor of Technology and Military Science through the Community College of the Air Force. He has served as an Instructor in the Law Enforcement Apprentice Course, as well as, the Assistant Performance Improvement Coordinator for the 37<sup>th</sup> Training Group. He has served on three Process Action Teams, supervised a cadre of five Quality Air Force Instructors – training over 1000 personnel in Awareness, Leader's, Teams and Tools courses.

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# POLICING OUR OWN PROCESSES

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**Tech. Sgt Derek T. Boyle**

*37<sup>th</sup> Training Group, Lackland AFB, TX*

## ABSTRACT

Our Law Enforcement Instructors envisioned increasing constraints, as well as the need for continued acceleration of excellence. Empowered by their commander, the transformation of a highly diversified group of active duty and civilian Navy and Air Force instructors into a formidable Natural Working Group transpired. They took a realistic look at the way we conduct business and streamlined our training process, increasing learning and customer satisfaction, while creating a significant annual cost avoidance and reduction in man-hours. The military of today and the future is dependent on people in the lower echelons taking the initiative to create their own destiny. Many of our processes are victimized by existing paradigms, and the only way we are going to meet future challenges is to police our own processes — beginning at the lowest levels, “freeing up resources for the modernization and quality of life needed to build the force of the future,” as stated by the Secretary of the Air Force, Dr. Sheila E. Widnall. This team is the perfect example of institutionalizing quality principles in today’s Air Force. Inevitably, the team used existing resources and future constraints positively improving the United States Air Force’s, Security Forces.

## INTRODUCTION

The phrase “Do more with less” was once a plausible statement; however, today, it has become an excuse evolving into “We didn’t meet our goal(s) because we are doing more with less.” This is where the individual elements of involvement, initiative, empowerment, and effective resource management become fundamental. This is true regardless of what level you plug into the “big” picture. I’m going to tell you about a Natural Working Group, named appropriately the “Time Cops,” who capitalized on these essential elements of today’s military.

In the latter parts of 1995, instructors were answering Graduate Assessment Surveys (GAS) identifying areas where we didn’t meet our customers’ expectations. This becomes manpower intensive when we receive a reply from every supervisor receiving one of our graduates. The numbers indicated we were actually doing a good job, but there was a definite opportunity for improvement. The GAS wasn’t the only mechanism we had in place to identify customer commitments; we also utilized video teleconferencing as a medium to communicate with our customer, the Security Force career field. During these feedback sessions, different levels of leadership expressed their concerns in notable areas. Identifying the career field’s dissatisfaction was only the first part of the equation.

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## IDENTIFYING THE IMPROVEMENT OPPORTUNITY

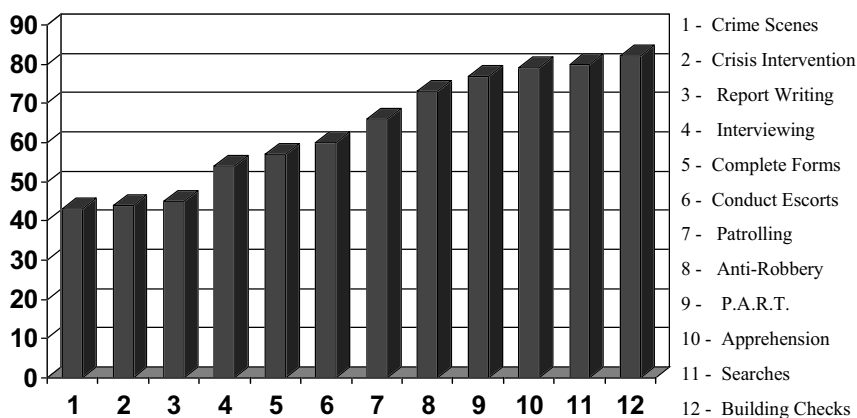
Resource management was the missing part of the equation. The concept of operation was inefficient and manpower intensive. Multiple instructor requirements (MIR) identify the number of instructors required per student for the various tasks taught. MIR differentiated from day-to-day generating manpower shortages and scheduling atrocity. I'll give you a graphic example of our previous concept. The course had 17 instructors to cover five classes in progress. On the 21<sup>st</sup> day of training, we had an MIR of one instructor to every four students. With an average class in excess of 45, we had to schedule 12 instructors to complete the training, leaving only five instructors to cover the other four classes. MIR shortages became status quo. The course experienced several cuts in course length throughout 1995, so time management became essential in accomplishing our mission.

One of our Team Chiefs realized the importance of solving this equation, so he asked if anyone would be interested in participating on a Natural Working Group. To his surprise, we had participation from active duty and civilian Navy and Air Force instructors, as well as, from our Training Development Element. The Team Chief assumed the role of our Team Leader and gained support from all levels of our chain of command.

Early in January 1996, the team began meeting and defined the Apprentice Law Enforcement Training (AF/USN) as our key process. We immediately acknowledged our influence in shaping Law Enforcement graduates of tomorrow. Knowing the demands and competency levels placed on them were sure to increase throughout their careers. A meeting with the Process Owner established a three month working time line to complete the seven step continuous improvement process.

We started compiling data from existing indicators and metrics. A recent Field Evaluation Questionnaire (FEQ) indicated low satisfaction ratings on 12 different interrelated tasks.

Field Evaluation Questionnaire  
Supervisor's Rating of Training  
1995 - Satisfaction on Various Task



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## EVALUATION OF THE PROCESS

All twelve areas involved application and evaluation of a performance task. Data compiled from the Training Quality Assessment Survey (TQAS) was cross referenced with the FEQ results identifying two corresponding areas. Run charts were established on the two areas; progress checks (timely & accurate) and time allocations for practicing and applying new skills. Timely & accurate progress checks received a 94 percent average satisfaction rating for 1995 and time allocation for practicing and applying new skills received a 91 percent average satisfaction rating. These numbers would normally be considered outstanding; however, because of the correlation with the FEQ, we decided to break these areas down further. Before we could accomplish this task, we had to know where we were and where we wanted to be.

Our gap analysis revealed a significant gap between our goal, a mission ready apprentice airman, and where we were, supervisors receiving airman unable to perform apprentice level tasks. Evaluation of the process, combined with the data collected and the results of our gap analysis indicated it was logical to target the methodology of application and evaluation for major improvement.

## ANALYSIS & IMPLEMENTATION

Through various tools we isolated the problem in the flow of training. More specifically, our course was lacking continuum in task training throughout the course and insufficient time for practicing and applying new skills. Again, our concept of operation was faulty. The students were introduced to a subject, then shortly after the introduction they were allowed an insignificant amount of time to apply and practice the task. Evaluations would end their training day. Students would not utilize these newly acquired skills for the duration of the course. Upon graduation and leave, the students would report to their first duty assignment having forgotten portions of their training. The root cause was verified against the FEQ. Now, the team was truly convinced they were right on target, yet they also realized the solution may be the toughest part of the journey.

Our objective was to come up with an action plan accentuating two principles: ❶ Significant improvement ❷ Cost savings. Our action plan started with a force field analysis. Where we identified positive and negative areas of influence.

Course length and time were the most apparent hindrances to our process. Time constraints were certain, so we focused attention towards working within the prescribed constraints. This meant the course would have to be reorganized from day one to graduation. The force field analysis also assisted in identifying resource availability, both equipment and manpower, as credible limiting factors to reaching our objective.

We began by placing all knowledge and performance based subjects into a logical sequence. Using our current manpower table, we began to allot application and practice time throughout the course. The flow was designed to utilize a consistent and minimal amount of instructors, without hindering interaction or learning. Our new course design yielded an additional 16 hours of application or practice time for the students. This could only bring about positive results, but our mission was far from over. Evaluation was yet to be contended with.

Our team envisioned all evaluations would be realistic, pertinent to current threats, and taking place in



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the days just prior to graduation. This would allow us to send only the most qualified students to the field. We had three days dedicated strictly for evaluations, more commonly termed as “Evaluation Week.” Students were assigned to one of three elements, participating in one of three activities each day. For example; Element #2, day one, would complete all Law Enforcement oriented evaluations, day two they would complete all security oriented evaluations, and day three they would assist by role playing. The other two elements would perform the same type of activities respectively. Initially, our methodology was looked upon unfavorably because we had conducted evaluations by using different stations within a two block radius increasing the student’s responsibility during the evaluation. Some saw this as leaving the students without constant supervision. Constant supervision at this point of training was nothing more than the usual paradigm. Realistically, in a matter of days the students would be in the field expected to perform similar activities with even less supervision.

The new course design was tested through two complete Air Force and Navy classes, receiving only the highest praise from students and leadership alike. The Process Owner was equally eager to implement the program full-scale.

## THE RESULTS

The results varied from immediate to gradual. GASs from supervisors receiving students from the first quarter after implementation improved, and by the fourth quarter the number of unsatisfactory GASs decreased by 60%. TQAS verified a 4% rise in student satisfaction of progress checks and a 6% rise in student satisfaction of practicing and applying new skills. More gradually we achieved a substantial cost savings; a total DOD cost avoidance for FY 96 reached \$82,390.56. The cost avoidance can be accredited to the reorganization of the course and saving 4248 man hours during FY 96.

The team concluded their journey by conducting inservice training and updating course charts, plans of instruction, progress checklists, and all other required documentation. The paradigm shift we created overflowed to other courses looking to reach similar objectives. Today, the concept of operation is still widely referred to with laudatory comments. With the integration of our career fields, this particular program may not survive; however, the concept of operation will be preserved and used frequently.

## CONCLUSION

You may be asking yourself, “What does this have to do with Shaping Tomorrow’s Air Force?” Very simple, Operations Training is today and always will be an integral part of the Air Force. Recruiting, Basic Military Training, Operations Training, and Unit Training directly affect the completion, success or failure of the Air Force. Excellence begins and continues with proper education and training; we must approach tomorrow with new life and initiative willing to create paradigm shifts. Our team achieved the fundamental individual elements of involvement, initiative, empowerment, and effective resource management. Quality in Daily Operations is Tomorrow’s Air Force!

***“In no other professions are the penalties for employing untrained personnel so appalling or irrevocable as in the military”***

***— General Douglas MacArthur, 1933***

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### **1st Lt Scott Clark**

1st Lt Scott Clark graduated from Colorado State University with a degree in Electrical Engineering and was commissioned through the ROTC program as a Civil Engineering Officer. He spent two years at Columbus AFB, MS serving as a Civil Engineering Project Programmer and later as the Pollution Prevention Manager before moving to Utah. He is currently stationed at Hill AFB, UT in the Environmental Management Directorate Compliance Division as the Air Quality Database Manager.

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# Environmental Assessment Tracking System (EATS): An Intranet Environmental Impact Analysis (AF Form 813) System

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**1Lt Scott Clark**

*Environmental Management Directorate, Hill AFB, UT*

With the increased need for timely Environmental Impact Analysis, an efficient system to create, update, route and track all pertinent process information is needed. Currently, the Air Force uses a manual process for creating this document referred to as a Air Force Form 813. The Environmental Assessment Tracking System (EATS) system was created to provide the Environmental Management organization at Hill AFB with a user friendly on-line system. EATS creates a preliminary Environmental Impact Analysis while capturing all the data necessary to make an assessment of any proposal from any initiator on base. The system tracks and manages these proposals along with maintaining history of the closed and canceled proposals. WEB technologies and Procedural Language/Standard Query Language (PL/SQL) were used to develop the system.

## **Background:**

The reason for exploring a computer approach to create and track Environmental Impact Analysis submittals occurred because of complaints from reviewers and submitting agencies. Once an 813 form was submitted, the reviewer frequently needed additional information to make an accurate assessment. This required the initiator to be recontacted and to resubmit the form with additional information. The procedure was very time consuming and frustrated all parties involved in the process.

In early 1996, the Environmental Management Directorate decided an electronic submittal system that could store information, track progress, create 813's, and update modifications would be desirable. Initially, the EATS system was planned for personal computers connected to the base Local Area Network (LAN). The advantages of WEB technologies, however, were too great to be ignored because of the unlimited access to individuals it could offer to users. EATS was constructed as a WEB site, accessible to any base employee with Intranet access.

The EATS system was designed with an initial screen which looked very similar to a Form 813. The user or initiator fills out the blocks to explain their process change. The user then can access a hierarchical level under the Environmental Effects table for different environmental fields such as Air Quality, Cultural Resources and Water Resources, to name a few. If the user clicks on the hyperlink for one of these environmental fields, additional questions are displayed to gather data from the user relating to the environmental field chosen. This information can be used by the environmental assessor to more accurately assess the effects of the proposed action.

Once the 813 information and Environmental Effects questions have been answered by the initiator, the data/form is forwarded electronically into the supervisor's electronic workbasket. After the supervisor reviews it, the supervisor has the option to send it back to the initiator for changes or send it on to the approving official (Environmental Management in this case). The approving official, after reviewing the form/data, then returns it to the initiator, makes appropriate

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changes or prints out the 813 for a signature. Once the 813 is signed and approved, the approving official locks the data from ever being changed and stores it in the system.

To control the data, print reports and monitor data, a Functional System Administrator capability was built into the system. One, or several individuals, can be given this responsibility to control access, consolidate reports and make minor system modifications. The Functional System Administrator serves as the owner and ultimate operator of the system.

The system was developed lacking some features necessary to operate such as simply printing out the 813. This occurred because of some of the demands and WEB technology restrictions which were unfamiliar challenges to the developer. NCI was selected to develop EATS with government guidance and assistance in testing. As the second release was completed, the problems were patch worked and a system meeting the bare minimum requirements was completed. The next block describes the current system capabilities.

### **System Capabilities:**

#### ***Terms and Acronyms:***

Initiator	The person who generates the proposal
User	Anyone who accesses the system
FSA	Functional System Administrator
proposal	Request for any act which could have an environmental impact
EATS	Environmental Assessment Tracking System

#### ***General Capabilities:***

1. EATS tracks the proposal from Initiator through completion to history.
2. EATS provides help screens to provide the information needed to use each screen and guide them through the data selection/input process.
3. EATS allows any User to view/browse any and all proposals in the database.
4. EATS allows a User to list and track the historical activity of a proposal. EATS stores and displays who's work area the proposal has been in, the Origination Date, Completion Date and Status of the proposal.
5. EATS invokes a secure process to ensure only the authorized User has access to the data they are allowed to access or review.
6. EATS identifies when a proposal is new to a User by having a separate Create Form and Browse Form functions.
7. EATS provides unique user access to the database and screens based on their User Type.
8. EATS generates the proposal numbers with a year prefix and a system generated number in the following format: yyyy - XXX.
9. EATS allows the User, once given access by the FSA, to change their password.
10. EATS allows the User to run several reports based by date, location, organization or requirement number.

#### ***User capabilities:***

EATS allows the User to be associated with an organization and have access to information on their proposals for that organization regardless of which User originated it. However, the User has only update access to those proposals they initiated and have not been released to Environmental Management for assessment.

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EATS allows the Initiator to save, retrieve, update and delete proposals they have initiated and have not released to Environmental Management for assessment. It also allows the User to select lists, through hyperlinks, of additional data and guides them through the construction of the proposal. EATS then ensures the proposal is approved by an authorized user (supervisor) before the proposal is released to Environmental Management for assessment.

***Workbasket Utility Capabilities:***

EATS allows proposals to be transferred from one User to another for further review or approval/disapproval through the Workbasket. In addition, movement/access of proposals is time and date stamped for statistical purposes.

***Environmental Management User Capabilities:***

EATS moves the proposal to the authorized approving official to review for completeness and allows the proposal to be moved back to the initiators workbasket for additional information/data. The approving official can also print a Form 813 to be analyzed and approved. Through the system, the Environmental Management approving official can approve/disapprove, change or return the proposal to the Initiator's workbasket.

***Functional System Administrator (FSA) Capabilities:***

EATS allows the FSA to delete all closed and canceled proposals from the system as required. EATS also allows the FSA to add, change, delete or retrieve User profile information, User Type validation data, Proposal Type validation data, and User validation data. The system allows the FSA to validate user and organization tables as updating becomes necessary. EATS allows only the FSA to print out consolidated reports concerning proposal numbers, dates and status.

***Screen Samples:***

1. The following page shows the main menu screen.
2. Any User will have access to the Form 813 Options, Password and Report Screens. Only the designated FSA would have access to the Functional System Administrator options.
3. Restart, Menu, Workbasket and Help are hyperlinks to additional information.

**Workbasket Menu - Microsoft Internet Explorer**

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites Print Font Mail


Address [http://tenbears.ogden.disa.mil:8002/eats/owa/wb.verify\\_login](http://tenbears.ogden.disa.mil:8002/eats/owa/wb.verify_login)

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**Menu Options for Scott Clark**

[\[Restart\]](#) [\[Menu\]](#) [\[Workbasket\]](#) [\[Help\]](#)

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 **EATS - Environmental Assessment Tracking System**

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**Form 813 Options**

- [Browse Form 813 \(Browse813\)](#)
- [Create a new Form 813 \(Create813\)](#)

**Print**

- [Print AF Form 813 \(Requires individual PC setup\) \(Print813\)](#)

**Password**

- [Change Your Password \(Passwd\)](#)

**Report Screens**

- [Requirement Report by Date \(DateRpt\)](#)
- [Requirement Report by Location \(LocRPT\)](#)
- [Requirement Report by Organization \(OrgRPT\)](#)
- [Requirement Report by Rqmt# \(RqmtRPT\)](#)

Scrolling down we get...

**Workbasket Menu - Microsoft Internet Explorer**

File Edit View Go Favorites Help


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**Password**

- [Change Your Password \(Passwd\)](#)

**Report Screens**

- [Requirement Report by Date \(DateRpt\)](#)
- [Requirement Report by Location \(LocRPT\)](#)
- [Requirement Report by Organization \(OrgRPT\)](#)
- [Requirement Report by Rqmt# \(RqmtRPT\)](#)

 **WB - Workbasket Application Configuration**

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**Functional System Administrator**

- [Activity Definitions and Dependencies \(Actdef\)](#)
- [Menu Code Maintenance \(Menu Codes\)](#)
- [Organization Maintenance \(Org\)](#)
- [Person Maintenance \(Person\)](#)
- [Position Maintenance \(Position\)](#)
- [Profile Maintenance \(Profile\)](#)
- [Reference Edits and Codes Maintenance \(Codes\)](#)
- [System Maintenance \(System\)](#)

**Functional System Administrator - Reports**

- [Database Report \(DBRPT\)](#)

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Workbasket Browser Application - 12 Jun 1997 12:46 - wb\_frm\_menu

If the user clicks on Create a new Form 813, the following screen appears (next 2 pages)

The screenshot shows a web browser window titled "AF FORM 813 - Microsoft Internet Explorer". The address bar displays "http://ambinet.osden.dia.mil:8002/ambinet/afp\_813/afp\_edit?actnew16". The form is titled "REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS (813)" and includes a link "(Return) (Home) (Help)".

Form details:

- AF Form 813 ID Number: 1997-3
- Origination Date: 24-APR-1997
- Status: ☐ Approved ☒ Pending ☐ Rejected
- Clear to Proceed Date:  Actual Start Date:  (Date format is DD-MON-YYYY)
- State Notify Date:  State Inspection Date:  (Date format is DD-MON-YYYY)
- Buttons: Update, Delete, Reset
- Text: Click on the Update button to save changes to the status and date information!

**SECTION 1 - PROPONENT INFORMATION**

To Environmental Planning Function:

Initiator Name: Clark, Scott  
Initiator Phone Number: 775-6913  
Initiator Organization: EMC

Scrolling down we get...

The screenshot shows the same web browser window, but scrolled down to the "SECTION 1 - PROPONENT INFORMATION" section.

Form details:

- To Environmental Planning Function:
- Initiator Name: Clark, Scott  
Initiator Phone Number: 775-6913  
Initiator Organization: EMC
- Title of Proposed Action:
- Need Date:  (Date format is DD-MON-YYYY)
- Purpose and Need for Action:
- Description of Proposed Action and Alternatives:
- Proponent Approval Name:
- Grade:  Date Approved:  (Date format is DD-MON-YYYY)
- Buttons: Update Section 1, Reset



Scrolling down we get...

**AF FORM 813 - Microsoft Internet Explorer**  
File Edit View Go Favorites Help

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**SECTION 2 - PRELIMINARY ENVIRONMENTAL SURVEY** *(Click the appropriate radio button and describe the potential effects.) (+ = Positive Effect; 0 = No Effect; - = Adverse Effect; U = Unknown Effect)*

Environmental Effect
AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE <i>(Noise, accident potential, encroachment, etc.)</i>
AIR QUALITY <i>(Emissions, attainment status, state implementation plan, etc.)</i>
WATER RESOURCES <i>(Quality, quantity, source, etc.)</i>
SAFETY AND OCCUPATIONAL HEALTH <i>(Asbestos/radiation/chemical exposure, explosives safety quality, distance, etc.)</i>
HAZARDOUS MATERIALS/WASTE <i>(Use/storage/generation, solid waste, etc.)</i>
BIOLOGICAL RESOURCES <i>(Wetlands/floodplains, flora, fauna, etc.)</i>
CULTURAL RESOURCES <i>(Native American burial sites, archaeological, historical, etc.)</i>
GEOLOGY AND SOILS <i>(Topography, minerals, geothermal, installation restoration programs, seismicity, etc.)</i>
SOCIOECONOMIC <i>(Employment/population projections, school and local fiscal impacts, etc.)</i>
OTHER <i>(Potential impacts not addressed above.)</i>

Update Section 2    Reset

*The Update button must be pressed to SAVE any changes to Section 2*

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**SECTION 3 - ENVIRONMENTAL ANALYSIS DETERMINATION**

Proposed Action Qualified for Categorical Exclusion (CATEX #):

CATEX #:  CATEX #:  CATEX #:

Scrolling down we get....

**AF FORM 813 - Microsoft Internet Explorer**  
File Edit View Go Favorites Help

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**SECTION 3 - ENVIRONMENTAL ANALYSIS DETERMINATION**

Proposed Action Qualified for Categorical Exclusion (CATEX #):

CATEX #:  CATEX #:  CATEX #:

Approving Official Remarks:

Environmental Planning Function Certification:

Grade:  Certification Date:  (Date format is DD-MON-YYYY)

Update Section 3    Reset

*The Update button must be pressed to SAVE any changes to Section 3*

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Complete Workbasket Activity

*The Update buttons for each section must be pressed to SAVE changes!*

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Workbasket Intranet Application - 12 Jun 1997 13:00 - eip\_813\_frm\_edit

If we click in Section 2 on Air Quality we get the following Source Categories to add more information to...

**Form 813 Air Quality - Microsoft Internet Explorer**

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites Print Font Mail

Address http://tenbears.ogden.disa.mil:8002/eats/owa/eip\_813\_fm\_edit?iactynr=16

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### Air Quality Source Categories

[\[Restart\]](#) [\[Menu\]](#) [\[Workbasket\]](#) [\[Help\]](#)

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[\[Return\]](#)

AF Form 813 ID Number: (3) 1997-3

*To add a new process, click on a link below.*

[Abrasive Cleaning](#)

Process Number	Process Code
<a href="#">28</a>	ABCL

[External Combustion](#)

Process Number	Process Code
<a href="#">27</a>	EXCO

[Fuel Transfer](#)

[General Process](#)

[Internal Combustion](#)

[Incinerator](#)

Scrolling down we get.....

**Form 813 Air Quality - Microsoft Internet Explorer**

File Edit View Go Favorites Help

[27](#) EXCO

[Fuel Transfer](#)

[General Process](#)

[Internal Combustion](#)

[Incinerator](#)

[Jet Engine Testing](#)

[Process Tank](#)

[Storage Tank](#)

[Surface Coating/NDI](#)

Process Number	Process Code
<a href="#">29</a>	SUCO

[Thermal Metal Spray, Welding/Soldering](#)

[Vents, Hoods](#)

[Waste Solvent Recovery](#)

[Waste Water Treatment](#)

[Woodworking](#)

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Workbasket Internet Application - 12 Jun 1997 13:06 - eip\_aq\_fm\_edit

If for example we click on Waste Solvent Recovery, we can enter in the following data....

Form 813 - Waste Solvent Recovery - Add

[\[Restart\]](#) [\[Menu\]](#) [\[Workbasket\]](#) [\[Help\]](#)

[\[Return\]](#)

AF Form 813 ID Number: (3) 1997-3

Make:  Model:

Capacity of Tank:  Unit of Measure:

Estimated Maximum Annual Usage:

Process Type:

If Other, describe other process:

Material Type:

Estimated Annual Recovery:

Workbasket Internet Application - 12 Jun 1997 13:16 - eip\_wsolvnt frm\_add

## **Results and Future Endeavors:**

EATS went On-line in October 1996. Access control and printout problems were evident bugs in the first version. The second version, resolving these problems, was released in April of 1997 and was tested base wide. Environmental Management is controlling access as the FSA. Feedback on the system has been good with approximately 20 individuals Beta testing the system.

The Environmental Effects table has not been finished due to budget restraints and only the Air Quality hyperlink has been completed. The exploration, definition and construction of additional hyperlinks such as Cultural Resources, Water Resources, Biological Resources and Hazardous Materials/Waste are planned for 1998.

EATS was designed as a stand alone system by NCI and was planned to interface with our newly constructed Air Quality database, called APIMS or the Air Permit Information Management System, to pull information into already defined and shared fields. Due to financial concerns (mostly costs associated with maintaining two separate systems) and database field discontinuities of the two systems, we've made a major decision to rebuild EATS within the APIMS structure. The front end, including internet access and basic structure, will be the same yet the database will be housed within APIMS. The APIMS data resides in a newly developed

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module which is part of the bases' Command Core System. Command Core is a base wide system constructed using Oracle linking Bioenvironmental, Safety, Health and some Environmental data. This project is currently contracted through BDM Federal and is planned for completion in October 1997. Obviously this merger of the two systems will increase the capabilities of the Command Core System and provide one system with many uses.

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***Master Sgt. (Ret.) Ronald G. Ferrick***

*Master Sergeant (Retired) Ronald G. Ferrick* is a Quality Integrator with the United States Air Force's Special Operations Command. His primary background is in military and commercial aircraft avionics systems. From 1979 to 1981 he spent three years with the Lockheed corporation as an Electronics Tech, then as a Computer Numerical Control Specialist. Ron's quality background actually starts with his work at Lockheed in 1979. He brought that experience back to the Air Force, managing his resources to lead his people to implement far reaching changes that saved the Air Force hundreds of thousands of dollars in aircraft parts, and millions in aircraft availability while stationed at George AFB, CA. from 1982 through 1985. After a 6 year tour to the Philippines, he became interested in quality management as a career. He has spent the last 6 years helping introduce and implement quality management principles to the Air Force Special Operations Command. He facilitates everything from quality awareness training to strategic planning. Ron is also a certified facilitator for Covey Institute courses - First Things First, The Seven Habits of Highly Effective People, and Principle Centered Leadership. His educational accomplishments include a Bachelor's degree in Hospital Administration from the University of Illinois. He spends his evenings and weekends doing things with his family.

***Staff Sgt. John D. Marshall***

*Staff Sergeant John D. Marshall* is currently assigned to the 16th Logistics Group, Hurlburt Field, FL, United States Air Force Special Operations Command where he serves as a Quality Integrator for the Logistics Group Commander. An 11 year veteran, SSgt Marshall spent the first eight years working avionics radio and radar systems on Air Force C-130 aircraft. The last two years have been spent implementing quality issues at both the squadron and group levels, working hand-in-hand with commanders to build effective quality programs within their units. He is a trained facilitator and instructor, spending many hours each month teaching classes, facilitating strategic planning sessions, process improvement teams, and creating training programs for other quality advisors. SSgt Marshall is also a certified facilitator of Stephen Covey's Seven Habits of Highly Effective People. Off duty, he is working toward a Bachelor of Arts degree with an emphasis in Total Quality Management. In his spare time, he enjoys woodworking, computers, and enjoying the warm Florida weather.

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# LESSONS LEARNED FROM UNSUCCESSFUL STRATEGIC PLANNING

*(HOW WE FIXED WHAT WAS BROKE)*

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**MSgt Ronald G. Ferrick**  
*16th Logistics Group, Hurlburt Field, Fla.*

## ABSTRACT

One of the first endeavors many organizations undertake in their quality journey is to enter into strategic planning. This begins a very labor intensive and sometimes painful process in the growth of their quality culture. Many times, too much energy is expended on writing the plan with little remaining to carry it out.

This can be very discouraging for both commanders and planning members. They want results for their efforts, and often are left with a product that may look good on the wall but doesn't drive real change in the organization.

Over the past two years, we have taken a thorough look at the way organizations approach Strategic Planning and the pitfalls they encounter. This paper explains a practical and proven approach taken by the 16th Logistics Group Quality Integration office to help combat those hurdles and ensure planning success.

## INTRODUCTION

In January 1996, the 373 TRS Field Training Detachment 7 approached our office and asked for help. They had been working for two months on their strategic plan, with little progress. One member termed their efforts as "flopping around in the abyss." An IG QAFA inspection team was due to visit in approximately two months, and the detachment felt like they were never going to finish in time.

We worked with their Quality Council for the next two months. In that time they released an effective and motivated strategic plan. They breathed a sigh of relief and awaited the visit. The IG conducted their assessment, and the 373rd FTD became the first FTD to ever receive an excellent rating on a QAFA.

While this may not seem like an amazing story, the interesting part actually occurs a year later. Action plans are still worked, objectives are being closed, and customers are happy as never before. Bottom line - this plan has changed the way this FTD does business.

## TWO YEARS BEFORE.....

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In preparation for our own Quality Air Force Assessment (QAFA) during the spring of 1995, we spent many hours helping squadrons through the strategic planning process. After the assessment, we noticed that many plans worked their way onto bookshelves, and were never mentioned again. We spent a lot of time looking at current strategic planning practices and interviewing commanders and quality advisors, trying to pinpoint what had gone wrong in the process.

Commanders were not very happy with the results they were getting from strategic planning. They wanted a product that would function like a daily planner; something that would drive action and could be reviewed periodically. Bottom line, it had to make sense. Current strategic planning methods were not meeting their needs. Planning members often got discouraged because they saw no added value for this stressful process. Some felt it could last forever. Facilitators were also discouraged because they usually didn't understand the training or the tools they had been given. Many used the AFQI 11 step model, but found it hard to get meaningful results for their efforts.

The most unhappy people were the workforce of the organization. They remember what they were taught in quality classes and wanted management styles to reflect that, not more vague statements and pretty charts on the walls. Let's not forget the customers, ineffective plans were doing nothing to help them...

Talking with leadership and managers, we found that it was not "what" they were doing, but "how" they were doing it that caused problems. Current methods were not creating results, and that demanded a change of focus. We took a long hard look at the eleven-step model and felt it contained all the right ingredients. If it wasn't the model, it had to be the way it was used. We went back and looked at our strategic planning course. Read tons of books, even attended a few conferences on the subject. Armed with all that valuable learning and information gained from leadership, we developed the following three phase approach.

## **THREE PHASE APPROACH**

### **PHASE 1:**

This phase is customer focused and designed to align the organization with it's mission and external customers by identifying, then meeting or exceeding customer needs. To accomplish this the entire plan starts & ends with the customer. It's here that we write our vision, mission, and values. After writing the vision statement, we identify our organizational strategy and express them through our goals and objectives.

**IMPACT:** Keeps organizational direction and focus on the mission, with results set for increased mission readiness and effectiveness. Substantial increase in effectiveness, well defined strategies, focused metrics, and measurable mission impact. This plan promotes the partnerships and trust we need with all customers to increase the success of all organizations within the Wing.

### **PHASE 2:**

A commander favorite, this is their reality check. In this phase we focus on filtering the improvement efforts through the critical compliance issues that can make or break our organization. All



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our efforts must meet safety, security, and budgetary requirements to ensure continued organizational production and capacity.

**IMPACT:** First plan to address critical compliance issues like safety, security, fraud waste and abuse, budget, ect., that can cause us to be ineffective, inefficient and negatively impact mission success.

### **PHASE 3:**

We've taken our direction in phase one, linked external to internal in phase two, and now we look to our internal structure and systems to examine what, if anything, presents obstacles for us to achieve our strategy - our goals and objectives. Through a mapping process we will discover how our systems operate, what work efforts contribute to our mission and strategies and which do not. Most of them are valid and just need some adjusting to bring them in alignment with organizational strategies. Others will be reviewed to see which can be fixed, reduced, or eliminated. We conclude this phase with a complete metrics package, in place performance indicators and systematic feedback built in.

**IMPACT:** Complete organizational alignment, increased efficiency, and greater performance towards strategic results. Roots and ignites the culture in the organization.

## **LINKING IT TOGETHER**

As we stated earlier, there aren't any real problems with the steps in the Air Force model. We have changed our focus on some of the steps and made the process more effective and efficient. The remainder of this paper addresses the external phase of our approach.

## **PLANNING TO PLAN**

### **KEY OUTCOMES**

At this point in our planning formulation, we need to identify what it is we do and who we do it for. Starting at the flight level, we name the key products and services that are provided.

The council will:

- Identify the major flights in the organization.
- Identify the key products and services that are provided. These are the major things they produce for their customers. (This is not a laundry list of all that you do, it's the main purpose of each flight)

After we identify them, we list customers and suppliers for each. Most people have a hard time identifying who their true customer is, so we take them through a customer identification session where they learn who their "real" customer is and why.

## **PERFORMANCE INTERVIEW SHEET**

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With customers identified, we provide a performance interview sheet that will be used to ask questions during customer interviews. The organization is then tasked to visit their customers, in person, within the next two weeks and get answers to these questions. The responses we get will be used to influence the vision statement.

On the top of the survey, we list the products and services that are provided. This information comes directly from our key outcomes step. We then ask customers to prioritize the importance of these products/services from their perspective. This lets us know the value of each important thing we do.

The rest of the survey consists of four questions. The first two address priorities and unfulfilled needs, while three & four point us to opportunities that improve or increase the effectiveness of our products and services.

**1. What's really important about the products and services we provide you? Why are these things important, what impact does it have on your mission or success. How well are we meeting your needs?**

We know what they expect — they expect us to do the jobs we were trained to do, and we must continue to do that as best we can. This question is concerned with meeting their 'needs' to increase their mission success. What are their real needs?

Here's an opportunity to take this a step further. Visit with your customer to see what they do and how they use your products and services. This will educate both yourself and your customer on capabilities and other applications that may exist for your products and services.

**2. What have they seen elsewhere that would increase their abilities to perform their mission?**

Think about the last time you PCS'ed or transferred into a new unit. You probably brought valuable information and experiences that were applicable to some of the things they did. How many times have you mentioned these things and they were accepted or at least attempted? How many times were they ignored, or you were told "we've always done it this way and we see no reason to change." We need to influence our people to think in terms of possibilities, allowing them to respond proactively on issues from different perspectives. How? Verify that the idea will improve the customer's abilities to succeed, then empower your people to brainstorm ways to make it happen. This serves two purposes, it satisfies your customer and your people are committed to the effort.

**3. What limitations do our products and services create or magnify for you while performing your mission?**

These might be those "pet peeves" that cause delays or interfere with other functions or actions they take. Why don't they tell us about these things? The main reason is their perceptions of our limitations. If we haven't been responding to their needs, it's easy for them to gain a perspective that we can't do the things they need. Another reason may be that the customer is not aware of what you can

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do beyond what you already provide. So, where would you gain this withheld information? Visit with them and let them know you're interested in their success.

#### **4. If they could do it today, what would significantly increase their ability to succeed in their mission?**

This one is a stretch because it doesn't ask them to focus on our organization when responding. We must first preface this with an understanding that their response must be *without limitations*. In other words, they are not to consider any obstacles or resistance when responding to this question. This response will be chock full of opportunities. Unfortunately, we may not be one of them. We have to look at this in the mind-set of doing all we can to help our customers increase their abilities to fight and win. We may or may not be able to directly affect improvement ourselves, but we may be able to contribute by referring these needs to the organizations that could impact or satisfy these needs.

Don't withhold important information like this. Get it out to those who can help your customer gain these abilities. Your customer will appreciate your efforts and it will affirm your commitment to mission success. You couldn't give them a much "warmer fuzzy" than that.

While these performance interviews are being conducted, the council proceeds with an organizational values assessment.

### **VALUES ASSESSMENT**

We take our values assessment and perform it in three distinct parts. They include:

- what values does leadership expect
- what values do our workforce see
- what values do our customers see

This almost becomes another type of gap analysis — only with values. Where do we think we are, where are we actually, and where do we want to go, all become part of this values assessment. What do these values say about your organization today? Which would you like to strengthen? Which would you like to change?

During the next stage, we obtain customer perceptions of our organizational values. We do this with by having an objective person interview our customers. This avoids any lack of trust issues that may prevent them from expressing reality. They will identify good values and a few not-so-good values. Keep in mind, though, that the values they state are their reality. The ones you'll be concerned with are the not-so-good values. Changing them usually requires looking at our systems and styles of management. Perhaps instituting new policies or reward systems to facilitate changing current attitudes and beliefs.

### **ANALYZE MISSION**

Before we can write the mission statement, we revisit the Key Output and Customer/Supplier lists we developed during the first step.

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A mission statement identifies who we are, what we do, and who we do it for. Why do we need one? It acknowledges the important contributions our people make to the success of both our organization and its customers. When we can identify ourselves in the mission statement, it tells us we are important enough to be noticed and identified by the leaders of the organization. These feelings of identity, belonging, and power are the foundation for esprit-de-corp.

How do you identify your mission? Identify your flights and the products or services they produce for the customers. It's these products and services, your key outputs, that must be addressed in your mission statement. Don't leave any of your people out of this important document.

## ENVISION THE FUTURE

Many paradigms are usually shifted by this approach; one that stands out in front of the others is the creation of a vision. If we truly believe that we exist for our customers, our vision must speak directly to their success. How do we do this?

Easy to say, yet hard to swallow. In a round-about way our customers write our vision. Gather those performance surveys that were completed earlier in the process and look them over. The four questions can be grouped into different categories.

**Question 1:** Unfulfilled Needs (Unclaimed Opportunities)

**Question 2:** Customer Comparisons (New-Start Opportunities)

**Question 3:** Product/Service Limitations (Improvement Opportunities)

**Question 4:** Customer Expressed Success Opportunities (Strategic Opportunities)

Affinitize the responses into similar groupings, or categories. Next, brainstorm headings for each category. Look for a theme in the customer responses. This is where your customer expresses what are the *Right Things*.

Now, identify your own organizational concerns. Put the two lists together, and link similar interests. Include any requirements that may exist in other higher headquarter goals and objectives. Using all this information, write your vision to the category headings and these other interests. Write the vision as though we've become these things already.

## ENVIRONMENTAL SCAN

These are the opportunities and obstacles to achieving our vision. Where do we get them from?

Here are six sources:

1. Leadership within your organization.
2. Leadership within the customer's organizations.
3. Leadership within your supplier's organizations.
4. Stakeholders in your organization's success

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5. Stakeholders in your customer's success.
  6. Stakeholders in your supplier's success.

Attach your vision statement to the scan sheet and send it out to your stakeholders. Collect and document their responses making any adjustments now needed because of more complete information.

## GAP ANALYSIS

It is here that we create the clear mental image of what we're doing, where we're going, and how we'll get there. Since the majority of our focus is external, it's rather new to all of us. We're being asked to challenge our paradigms. During Gap analysis, we review our current capabilities, which we accomplished in our mission step. Now we must look at our vision and see where we are going. We have to analyze whether or not we have the capability to get there from here with our current resources. If not, we have to weigh out possibilities, test our tenacity to overcome challenges. If we still cannot fill the gap, how much of the gap can we fill? Eighty percent, fifty percent, or even thirty percent? Try not to dismiss the opportunity just because you can't reach total satisfaction (one hundred percent). Strive for excellence! It's what moves organizations ahead and ensures their customer's success.

Think back ten or twenty years and how you wanted to buy a television, computer, VCR, or car that wouldn't break and require all the financial support to maintain them. The manufacturers knew they couldn't produce perfect products, but that didn't stop them from trying to make them as reliable as they could. Reliability became their vision; many of them called it quality. A good point to bring up here, when your vision is achieved it becomes a customer expectation! Now you buy computers that seem to last forever, and it's funny that you quite naturally expect them to. The same expectations will begin to occur with your customers as you begin to meet and exceed their needs.

Once we've identified the gaps and what has to happen to fill them, we take these results and begin stating our goals and identifying our objectives to accomplish the goals.

## GOALS

It is critical to write goals as desired states. These results link directly to your vision. In that light, don't use action verbs to describe them. Goals reflect accomplishment of the objectives supporting them, not their continuation. In other words, goals set the performance standards for the objectives supporting them.

Example: My personal vision is to own a consulting firm and be an expert in quality theories, skills, and application techniques. One of the vision requirements is a Master's degree in Human Resource Management. This is an obvious goal I must attain. As a goal, how should I state that?

- Possess Master's degree in Human Resource Management
- or
- Improve Educational Opportunities to obtain a degree

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The first example reflects the result of fulfilling the requirements for the degree. This goal clearly satisfies a portion of my vision. The second example asks me to improve my chances to obtain the degree. Will improving my opportunities satisfy my vision? What if I improve my opportunities but don't attain the degree? I would have satisfied the goal but fell short of the vision.

Review your vision statement, goals will flow right out of it. Gap analysis steps us back from the process to view the big picture. You see the opportunities and obstacles between where you are, and where you're going. Link these to your Key Products & Services and write your goals to the opportunities that match up to the themes in your vision statement.

Remember to write them as desired states. Using verbs like "improve" or "enhance" will only make your goals moving targets. Remember, your goals set the performance standards for the objectives supporting them.

## **OBJECTIVES**

Unlike goals which state achievements, your objectives will describe the actions or levels of performance that must occur to bring closure to the goal. These actions or levels of performance become your metrics. Objectives use action verbs that link their attainment to the goal. Since the goals are linked directly to the vision, the objectives quite naturally stay in that flow. This shared vision will give your objectives the purpose and energy to be adopted by those responsible for accomplishing them.

Our objectives link external customer needs with the internal suppliers of the organization. This is your opportunity to empower ownership of the objectives by tasking them to the flights and shops to develop. The effect of this approach is a plan that begs to be acted upon, not one that we can choose to ignore. Assign a POC and identify a preliminary timeline for completion.

## **ACTION PLANNING**

This step roots the culture in the organization. Our flight members become active participants. They must first identify their key processes, then map out the process and identify customers and suppliers. Now they interview their customers to identify their important needs. Once validated by asking "why" until it connects to mission performance, these needs become the workcenter's performance indicators and the flight's metrics. Gather that data, build a baseline, then identify the obstacles in your processes that prevent you from making this happen for your customers. Now write your objectives to overcome these obstacles. Once produced, your metric goes to your customer for validation before it's displayed to anyone. This puts integrity to the data and builds trust in the customer-supplier relationship.

## **SUPPLIER PERFORMANCE SHEETS**

Supplier performance indicators are necessary to align our suppliers with the direction our organization will be taking, and any shortfalls we are experiencing or expect to experience in the future. Quality isn't a one-way street, our suppliers must contribute to our efforts to help our customers succeed. Each flight and workcenter should interview the suppliers of their key processes.

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Our suppliers need to know of:

- The needs of our organization to fulfill its' vision.
- Our current or developing capabilities supporting our customers.
- Future requirements not previously identified to our suppliers.
- Supplier products or services that limit our ability to meet current or changing customer needs.
- Requests for assistance in resolving any supplier shortfalls.
- Requests for information on supplier capabilities our organization may not be currently aware of.

## CONCLUSION

This brings our strategic plan full circle. We started with our customers identifying the *right things* to do, and we end with customer validation of the metric results to verify we've done the *right things*, the *right way*.

The other parts of this approach, Compliance and Key Internal Functions, can be obtained by e-mail from:

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or

John Marshall  
marshalj@hurlburt.af.mil.

## References

Air Force Quality Institute (AFQI), The Quality Approach, Air University, Maxwell AFB, Alabama, 1996.



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# WE DON'T KNOW WHAT TO MEASURE....

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## ABSTRACT

Of the three parts of the QAF System model, the Quality in Daily Operations component has proven to be the most difficult for many to integrate. Strategic planning and process improvements have become a highly visible part of our quality culture. Quality in Daily Operations, on the other hand, continues to be a tough hurdle for some to overcome.

Our experiences have shown that a major heartache in this process has been developing metrics and tying all that effort into “daily operations”. Collecting data is not a problem, in fact, organizations love to collect data, and will not hesitate to hang it on the wall and call it a metric. While this is commendable, the graph on the wall does nothing to drive appropriate leadership action or act as a performance indicator.

This paper explains the practical and proven approach taken by the 16th Logistics Group Quality Integration office.

## INTRODUCTION

*“We don’t know what to measure, so we measure everything”  
“Sure I know who my customer is. The American taxpayers, of course”  
“Get this quality \*stuff\* out of my shop, we don’t need it to do our jobs”  
“This is just creating more work and taking more man-hours to  
create graphs just to accomplish the same things.” “What for, we  
were doing fine without all this extra effort?”*

These comments clearly show the frustration our people experience when trying to implement quality into their day-to-day jobs. Over the last three years, we have worked with many senior leaders and mid-level managers, helping them integrate quality into all levels of their organizations. One of the hardest paradigms for them is the importance of their customer (yes, even military organizations have customers and no, it’s not the enemy) and the added value of real metrics.

Part of the problem is the large number of Quality buzzwords that exist in the field. Words such as metrics, measures, efficiency, indicators, needs and effectiveness are plentiful when people get together and talk about Quality. In fact, they are so often interchanged that most people forget what they really mean.

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## ALL THOSE BUZZWORDS

Helping our people understand all those Quality buzzwords has been one of our biggest challenges. To ensure we are all operating off the same sheet of music, let's review a few.

### CUSTOMER

- Everyone provides a product or service to someone else. Everyone reading this should realize that they provide one or more products and/or services to "*someone else*."
- That "*someone else*" is your customer. The tasks and processes that you perform in your daily jobs affect someone, and it is important that you recognize them as your customer. Your customer also has a customer, and there is also an end user for the product/ service, but what we are looking at here is your immediate customer, that person you impact on a daily basis.

### EXPECTATIONS

Let's assume you have a flat tire, and you want to get it fixed. Given the choice between Burger King™ and Joe's tire shop, where would you take your bad tire? Probably not to Burger King. Why? Because you don't "expect" them to fix it. You do, however, expect Joe's tire shop to fix your tire, and so that is where you would take it.

The Quality Approach defines an expectation as: Customer perceptions about how your products and services will meet specific customer needs and requirements. For instance, a typical customer expectation is that we will do the jobs we have been trained to do. So, if you want to get your tire fixed, you expect the tire shop to have the competence and expertise to do the job, not the Burger King. You make this decision based on knowledge and past experiences.

Lets go back to our guy at Joe's tire shop. He is there because he expects them to fix it. He probably has some other expectations, so let's mention those:

- It will be fixed according to manufacturers specifications
- It will be filled with the proper amount of air
- It will be properly fitted/ balanced

An easy way to identify expectations is to make note of the things that your customer expects of you but doesn't feel the need to mention at every transaction. These expectations are implied and accepted, which makes them unspoken as well.

### NEEDS

Our needs, however, are very different from our expectations. Needs are more important - the "mission stoppers" - that affect the success of our customers and ultimately the success of the mission. Bottom line; it's a "what do my customers need to succeed and what can we do to make it happen" way of thinking.

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As we look back at our tire example, ask yourself what would be the most important thing about the service (fixing the tire) that Joe's tire shop provides for you. Your responses might include:

- Done right the first time - no leaks
- Tire is ready when promised

## EFFICIENCY AND EFFECTIVENESS

What kind of issues are we talking about when we mention efficiency?

- reducing cycle times
- reducing manhours expended
- reducing error rates
- reducing costs

Most of the issues that we discuss when talking about efficiency deal with how we can do things quicker and cheaper. They focus on internal areas of the process, corners that we can cut or better operating techniques that enhance our ability to save time and money.

Effectiveness, though, deals with a completely different set of issues, most notably our customers. When we talk about effectiveness, we need to remember the basic concept that everyone has a customer which they provide a product/service to. How well does that product or service lead to the effectiveness of your customers? How well does it enable them to do their jobs? It is "their" effectiveness in mission accomplishment that is important when we talk about our own effectiveness.

Bottom line - effectiveness means **doing the right things**, efficiency means **doing things right**.

## MEASURES AND METRICS

Let's begin by looking at the definitions straight from the 1996 edition of the Quality Approach.

**Measurement** — The act or process of quantitatively comparing results to requirements to arrive at a quantitative estimate of performance.

**Metric** — A measurement, taken over time, that communicates vital information about a process or activity. A metric should drive appropriate leadership or management action. Physically, a metric package consists of an operational definition, measurement over time and presentation.

Read those definitions and it's not surprising that many people don't understand the difference between the two. They are very vague. No wonder people are measuring one thing and metricing another, while collecting data on something else. Given the power, we would tweak them a bit to read:

**Measurement** — The act or process of gathering data to indicate a capacity, quantity or level of performance. Can be used to drive actions that contribute to process efficiency.

**Metric** — Data collected over time that connects your process results to your customer's requirements. Metrics are used to drive management decisions that are equally important to you and your customer.

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We can measure anything we feel is important.

We only metric those things important to the customer. (and us, of course)

## TYING IT ALL TOGETHER

Now we can tie some of the terms together, and see where they interconnect. When we use the word “measure”, we refer to those tasks we perform in our internal processes. All those things that happen behind the scenes in the Joe’s tire shop can be measured, if management so deems them important. Below are some of the things that we typically measure.

- **Receiving** - Time, Accuracy, Qty
- **Scheduling / Suspense’s** - Accuracy
- **Routing / Distribution** - Qty, Time, Errors
- **Setup & Preparation** - Time, Costs, Errors
- **Repairing** - Qty, Time, Costs, Materials, Errors
- **Delivery** - Qty, Time, Costs, Materials
- **Ordering** - Time, Qty, Errors
- **Storing / Filing** - Type, Qty
- **Testing / Inspecting** - Qty, Types, Pass/Fail Rates

Notice how internal and efficiency-centered the above items are. While some of these may be important to you, they usually are not important to your customer. Why? They expect you to do these things, because it is part of your job. It’s what you’ve been trained to do. They already expect you to do it to the best of your ability. Your customer does not really care about your internal routing or setup times. They don’t have time to concern themselves with accuracy problems that are deeply imbedded in your process.

They do, however, care about the end of the process - the product or service that they receive - and what is important to them about that product or service is what we metric. Metrics are vital indicators that describe how well the entire process is working. The key to metrics is involving your customer and determining their needs. Notice we said needs, not expectations. When we talk about metrics, think of customer needs. Think about their effectiveness, and the part you play in their success.

It’s a funny thing about customer needs - a lot of us feel that we already know what the customers require to do their job. Some of us even openly admit that our customer doesn’t know what they want, so we just give them whatever we want or what we think they need. While this may sound funny, it does not help us when we talk about establishing metrics.

## VALIDATING CUSTOMER NEEDS

To validate your customer needs, ask them - don’t assume you already know. This can require a little effort, because it will require you to physically contact your customers and meet with them and ask them some questions. Don’t ask them “ How well are we doing, or are we doing a good job?”. This will not give you the kind of answer you are looking for because in a way, you’ve loaded the question

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and limited the parameters of the response. They will probably just nod their heads and proceed on, very much doubting your sincerity.

Ask them “What is important about the product or service that we provide you?”. Provide them with a list of products and services you already provide, and find out what is important to them about each one. This ensures that the responses speak to their needs, not their wants.

Capture those needs in writing. Don’t only ask what is important, but ask why it is important. You want to make sure that it is a critical, not just a wish. These metrics may end up looking different than the ones you’ve done in the past. Considering we are now asking our customers to help identify what we should be looking at, they should look a little different and we want them to.

## **CAPTURING A GOAL**

Take those customer-identified needs and make those your metric. For example, if your customer identified that the most important thing about your product/service is that everything be complete, metric the percentage complete, with a goal of “nothing missing”. Accuracy, on-time percentages, and on-target requirements are other kinds of issues that your customer will identify as critically important.

## **WHAT IF YOU DON’T MEET THE GOAL**

If you aren’t meeting that goal, you probably aren’t meeting their needs. The first question to ask yourself is “What are the obstacles preventing me from obtaining the goal”. Write an improvement plan to overcome those obstacles, and post it next to your metric. Share it with your customer, and share the rewards that this synergy will bring.

Keep in mind that many people feel that customer expectations are synonymous with customer needs. If a workcenter hasn’t taken the time to identify the needs of their customers, you will probably hear them say things like “we don’t need to talk to our customers, we already know what they want.” Under that assumption, they go about doing what they see as important while viewing any customer complaints or needs as whining.

There is also one other trap in this metric building process. Once you have met your customers needs for a period of time, those needs will turn into expectations. Your customers will probably come up with a whole new batch of needs, so beware! Have fun working together and making a truly effective team.

## **A REAL STORY**

This example came from some of the first training that we conducted almost two years ago. We were approached by a backshop maintenance repair facility and asked to help them do some of that “quality” stuff. We went down into their workcenter, conducted some initial interviews, did some flow-charting, and found some very interesting things. Their fundamental job is to repair parts, so that’s where we started.

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Most of the bad parts that they receive are delivered by the Supply squadron - they have been tagged bad by someone in the field and routed through Supply to get to the backshop. During our initial interviews, we collected some basic information about their repair process. We identified the process owner as the backshop and the supply driver as their supplier since they were the one that delivered the part. They said the aircrew was their customer since the aircrew used the parts they fixed, and also were the people that broke the parts. When asked about the metrics that they currently show, they identified two particular slides that related to parts repair processes. They included:

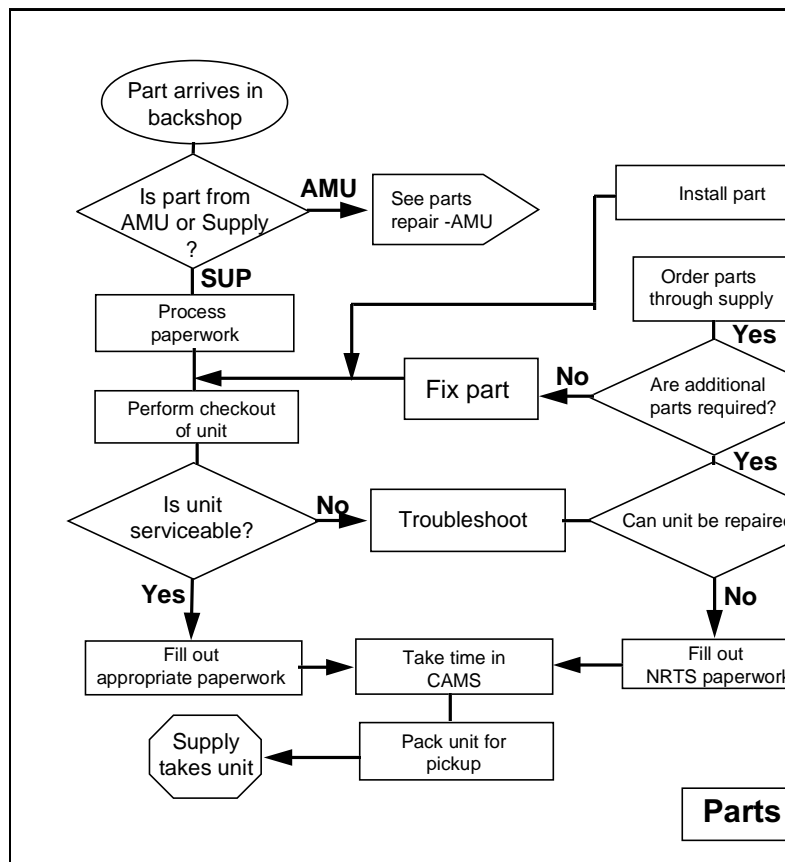
**Part reparability rate** - the number of parts they were able to fix. The backshop has a high repair rate, so their stats were 96% + on this chart. Looking good!

**Repeat/recur rate** - this indicates the number of times that repaired equipment failed for the same malfunction when it reached the field. Again, they are doing good work, so the percentage of repeats is low - below 5%.

From there we proceeded through a flowchart of their repair process.

Before we go any further in the story, let's review some parts of the flowchart that may be of use to you in your journey. Notice all the decision blocks in the flowchart. There are five and each one can be directly related to a "yes-no" action that takes place within the repair process. Each of these blocks is an indicator or measure of efficiency. To identify valid measures, you should examine each one and determine if measuring it is value added. In the above example, how many parts come from the AMU versus the flightline might allow you to measure where your workload comes from. Knowing whether additional parts were available might indicate how well your benchstock process is working. These are all internal measures, and it is up to you to determine which are important. Evaluate them, and if you feel they are important, measure them and continue to collect the data.

The first block in the upper left hand corner is your start block, and it is probably here that you will identify your main supplier in the process. Likewise, the bottom stop block in the flowchart is when you relinquish control of the process, and it is here that you will find your customer. Notice that the flowchart only validates your true customer; it does not point you toward a metric.



With the flowchart completed, we asked our backshop workers to look at the process and identify who their customer was? Hint: It's isn't the aircrew.

Supply is the actual customer in the process, and it's interesting to note that the aircrew doesn't even show up in the process. This is a common mistake for many when setting up metrics - people just assume they know who their customer is. Keep in mind what we stated at the beginning of this paper. We are looking for the most immediate customer - not an end user. With the right customer identified, we next find out what their needs are. Ask "What is important about the product or service we provide?" Go to Supply and ask them this question. Make sure you do it in person, so that they know you are sincere and you are able to get all the information you require.

They went and did it. They asked the question. The answers they received were surprising. Supply's answer was "Right tag, right part, and complete and accurate paperwork." Remember that you also need to ask why - validate that this is truly important to your customer.

The right tag needs to be on the box, whether it be yellow, red, green, etc. Yellow Tags (good parts) go back into supply, Red Tags (bad parts) go to the depot to be repaired. The right tag ensures the part ends up in the right place. The right part is also important. Don't turn in a toaster in place of an aircraft radio. They don't substitute too well. Complete and accurate paperwork is also a must. The

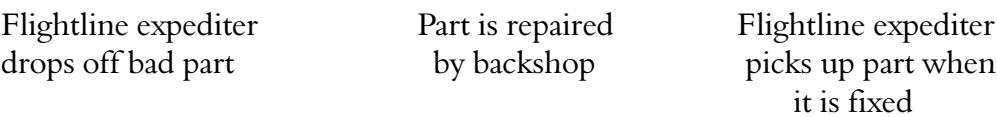


right stock numbers, part numbers, supply document numbers, etc. must all match the supply computer in order for the transaction to complete, so this must all be complete and accurate.

Any one of these three are bad, and the part ends up in Supply’s research section waiting for someone figure it out. This takes the part out of the supply loop, and could directly affect mission readiness if the part was needed for an airplane that was launching or some other real world requirement.

**DOES THIS REALLY HAPPEN?**

Yes it does! Our repair shop also gets quick turn parts in from the flightline. In this process, Supply is bypassed and the parts are dropped off directly at the backshop. Once fixed, they come back and pick them up. This saves a lot of time during pre-launch malfunctions. In this case, they also identified the aircrew as their customer, for many of the same reasons.



A simple flowchart proved otherwise. The flightline expediter who dropped off the part was actually their most immediate customer. So again we got them to ask the question. “What is important about the product or service we provide?” We sent them over to the flightline to find a flightline expediter and ask the right questions. Here’s the expediter’s response:

Quick and accurate status. Quick status is necessary because there are a lot of events happening with that aircraft. Fueling, loading, power on, power off, all things that the expediter must coordinate. That part that he brought to the backshop is another item to be coordinated, and he doesn’t have all day to wait.

Accurate status is really important because of all that coordination he is doing. If you give him an ETIC (estimated time of completion) of one hour, he will make plans accordingly and be back in an hour. But if you say another hour, and then another, it ends up stretching the job out all day requiring many unnecessary trips to pick up the part.

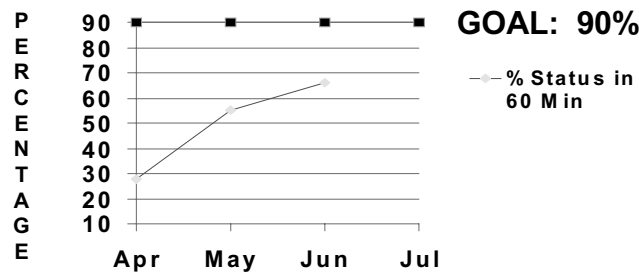
Here was the funny part of the story. The expediter doesn’t even really care whether you fix the part or not. He just wants a status - quick and accurate. He has a lot of things happening, and he doesn’t have time to fool around with inaccurate and timely ETIC’s. There are other avenues where he can get the part , i.e. Supply, CANN it off another aircraft, etc. if you cannot fix it. Quick and accurate status is what is most important about what you do for him.

Let’s revisit the metrics they had in place. They were looking at repair rates (which the AMU might not care about) when they should have been looking at their ability to give status’s. The metrics for part repair showed them doing great; the number for quick and accurate status’s was much lower. They estimated a quick and accurate status about 30% of the time.

Our final question to the expediter was to quantify what quick and accurate status really meant. We

needed this quantitative amount to be able to chart our progress as we made improvements to the process. They said that an accurate status called in within one hour 90% of the time would meet their needs. With this information, the repair shop now has a metric that identifies their customers needs and an acceptable level of performance, a goal, to shoot for.

## LOOKING AT THE PROCESS METRIC



Metric: Quick reporting of repair capability  
Goal: 90% within 60 minutes of receipt  
Timeline: Sep 96  
Customer: AMU Expeditor  
Purpose: Improve Readiness (Goal 1 Wg, Gp, Sq)

AMU Data Reviewed: 29 Jun 96, SMSgt Jones, 15 AMU

This metric is one that was created from working with the backshop repair process. It specifically addresses quick reporting of repair capability, with a goal of 90 percent with sixty minutes of receipt.

The signature block near the bottom of the metric is called “systematic feedback”. After you identify the metric, take the initial version to your customer and get them to verify it. This makes sure that you are metricing the right thing. You can also share the data with them periodically to make sure they are seeing the same trends that you are.

## DOES THIS ONLY HAPPEN IN MAINTENANCE?

No it does not. Let’s look at a few more examples from other types of organizations:

- The records section in the Medical Group tracks the total number of records that they process monthly. Ask any of their customers and you will find out that they don’t care how many records are processed. Their need is that their records are available (not lost) and at the right clinic for their appointment.
- The fuels section of Supply displays a metric showing how many gallons of jet fuel they pump a month. No customer cares about that. The most important need for that crew chief on the line is that the fuel truck is in place, pumping gas, fifteen minutes from the time he called it in. There’s a metric to show!

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## CONCLUSION

In closing, we hope that this brief example sheds some light on some of the problems that are faced when trying to establish good metrics. Our Quality principles point us toward customer focus, yet sometimes people tend to look elsewhere for answers. By taking the time to find out who your true customer is and what their most important needs are, you contribute to their effectiveness and the overall success of the mission.

Any further questions or requests can be addressed to:

marshalj@hurlburt.af.mil or rgf@fwbnet.com

## References

Air Force Quality Institute (AFQI), The Quality Approach, Air University, Maxwell AFB, Alabama, 1996.

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# **Reengineering For Tomorrow's Air Force...**

## **How to Build an Organizational Decision Support System**

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**TSgt Douglas R. Gaines, MSgt David Boggs**

TSgt Gaines serves as a Manpower and Quality Technician for the 18th Wing, Kadena AB, Okinawa, Japan. Primary duties include consulting on Unit Self Assessments (AFI 90-501), strategic planning, and benchmarking. TSgt Gaines has served as a Chief of Staff Team Excellence Award Technical Review Team Member and a Secretary of the Air Force Unit Quality Award Examiner. TSgt Gaines has a bachelor's degree in information systems management from University of Maryland, and master's of science in management from Troy State University. He is a member of the American Society for Quality Control.

MSgt Boggs is Branch Chief for the Mission Branch of the 18th Wing Manpower and Quality Office, Kadena AB, Okinawa, Japan. Primary duties include facilitating team development in all aspects of the newly formed career field of Manpower and Quality. MSgt Boggs has a bachelor's degree in information systems management from the University of Maryland, and an associate's degree as an instructor of technology and military studies from the Community College of the Air Force.

### **Abstract**

Effective information systems are critical to "shaping tomorrow's Air Force." Tomorrow's Air Force must be flatter and more responsive to changing world conditions. In tomorrow's Air Force information technology (IT) will be common place—the most essential tool in everyone's "tool box." This paper walks you through the process of developing such a tool.

This paper describes how you can build an Organizational Decision Support System (ODSS) that will help your organization reengineer itself from a functional hierarchy to a process based organization. After reading this paper, you will understand some of the common barriers associated with a hierarchical organization design and its impact on the organization's information systems. Additionally, you will learn how to utilize an NT Server (133Mhz or greater) to remove the barriers associated with a hierarchical organization design and how this server can be used as a primary tool to reengineer your unit into a process based organization. Finally, we present a step-by-step process for building an ODSS.

### **Information System Problems in the Heirarchical Organization**

**EXHIBIT 1: A HEIRARCHICAL ORGANIZATION DESIGN AND ASSOCIATED CHARATERISTICS AND ATTRIBUTES.<sup>1 & 2</sup>**

Exhibit 1 illustrates an organizational chart for a typical hierarchical organization; and some char-

acteristics, attributes, benefits, and drawbacks associated with this type of organization. For over 200 years, since Adam Smith published *The Wealth of Nations* in 1776, the hierarchy has ruled big business and big government. The hierarchies building blocks have always been and will continue to be “the functional department, [which is] essentially a group of people all performing a common task.”<sup>3</sup> Many undesirable characteristics and attributes are associated with a functional, bureaucratic, hierarchy.

For example, hierarchical organizations are usually data rich and information poor. Most of the time, IT is designed to track outputs of a particular function. These functional information systems are usually incompatible with other systems throughout the organization, resulting in fragmentation—information systems that don’t “talk” to each other. A recent study conducted by a process action team (PAT) in one overseas composite combat wing discovered that the wing relies on 28 separate “stovepipe” information systems for its critical data and information. The PAT concluded that these systems could not be tied together due to design and other limitations. Hierarchical organization cripples the organizational system (processes) and effective analysis and communication of vital data and information. Barriers to effective process management are the most destructive. However, barriers that affect data, information, and daily communication are equally destructive.

It is imperative that Air Force wings begin the transition to a more effective organizational design—a process based design. “Budgets are shrinking, the force is drawing down at alarming rates [the QDR calls for further reductions], and the USAF simply cannot afford to do business as it has in the past. The only constant is change and tomorrow is today—restructuring may be the only way!”<sup>4</sup>

## Information System Solutions for a Process Based Organization

### EXHIBIT 2: A PROCESS BASED ORGANIZATION AND ASSOCIATED CHARACTERISTICS AND ATTRIBUTES.<sup>5 & 6</sup>

In tomorrow’s Air Force “wings will be flat and organized around the very processes that are at the core of accomplishing the mission. Streamline and flexible, the new wing will capitalize on IT and innovation.”<sup>6</sup>

“This [exhibit 2] is definitely not your typical organizational chart. In fact, it is not an organizational chart at all. You will search in vain for indicators of hierarchy, power, and authority. Instead, it shows how resources come together to produce value; it depicts the business, not its administration. Arrayed at the top are the companies processes, each with its owner, directed at producing customer value. The ovals are centers of excellence, the incubators where people are developed and continually renewed. The vertical arrows represent the deployment of people from the centers of excellence to the process teams. Two questions invariably strike people when they see this picture and try to imagine how their own organization might embody it. The first is: Where do I fit in? The second is related: Who is my boss?”<sup>7</sup>

The transition to a process based organization does not happen over night. A prerequisite to even begin the transition is an effective information system. Now, let’s take a look at how to develop an information system that will help your organization transition from a hierarchy to a process centered organization. It’s called ODSS.

## Building an Organizational Decision Support System (ODSS)

Exhibit 3 illustrates the ODSS concept. ODSS is designed to track and monitor the organizational system. ODSS is the central repository for all key data and information and it ties the entire organization together. In other words, ODSS accepts inputs from all internal and external processes—customer relationship management, mission, support, supplier—and all internal infrastructure ele-

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ments—leadership, plans, and people. ODSS is used to store and manipulate essential data and information (inputs from the organizational system) and produce informational output, like mission performance results. In short, ODSS is a wing-wide information system that handles the entire wing's information needs. Amazingly, ODSS does all this through one user friendly interface and six main application modules (with plenty of room for future expansion), see exhibit 4. ODSS is implemented on a Windows NT Server using current Internet and Intranet technologies. Intranets are secure, because access is limited to personnel within the wing; Intranets are easy to use, because of the web page interface; Intranets are less expensive, because no client licenses are required for Microsoft Internet Explorer, which is distributed for free. Microsoft Access, SQL server, and CGI scripts are the power applications that “crunch” the data and information (relational and text-based database files) behind the user-friendly Web page interface. ODSS uses a variety of behind the scenes languages—Perl, Java, Active X controls, and Visual Basic—and protocols—Common Gateway Interface (CGI)—to manage the interface between the Web pages and the “data crunching” applications. These programming languages and protocols are used to program some of the more complex data input and output tasks. Additionally, ODSS relies on a series of other industry standard protocols, such as HTTP (Hyper Text Transfer Protocol), ODBC (Open Database Connectivity) Protocol, Microsoft Internet Information Server (Web Server), HTTP Demon, and Active Server Pages (ASP) to link everything together.

Exhibit 4 illustrates a simplified IPO (input, process, output) diagram for ODSS. As you can see, ODSS is composed of six modules—metrics, plan management, CBT (computer based training), surveys, manpower, and productivity. This diagram depicts how information from the wing system is input through one of the six modules, processed by ODSS, and output via a client PC. Of course, the diagram is somewhat misleading. In actuality, users will use the same client (a PC at their work location) to both input data and retrieve “near real time” informational output. Now, let's take a closer look at each module and some specific applications.

First, ODSS enhances an organization's ability to meet mission critical objectives. It provides each commander and leader with the capability to determine their organizations impact on the wing's established critical success factors, goals and objectives. This is primarily accomplished through the metrics and plans management modules. These modules allow senior leaders to “drill down” through the metrics associated with various process levels (mission, support, supplier). We will discuss the metrics module later. Second, ODSS's survey module, provides a means to determine internal and external customer satisfaction at the wing, group, and squadron levels. The survey module greatly simplifies the customer satisfaction determination process by making survey instruments accessible over the world wide web. Third, the CBT (computer based training) module of ODSS will provide computer based training that all wing members can access to receive “just-in-time” training on a variety of subjects. This module will also serve-up “downloadable” course material that can be used by qualified instructors to conduct unit specific training sessions. Additionally, the training module enables wing members and sister services to access a huge repository of training courses and materials, to include on-line scheduling. The last two modules—manpower and productivity—automate virtually every product and service that the wing MQ office provides. For example, suggestions are submitted on-line via the AF Form 1000. This process is projected to increase the suggestion rate and overall wing productivity.

## METRICS MODULE

Perhaps the most beneficial module within ODSS is the metrics module. A good metric reporting system is essential for organizations to transition from a functional view point to a process view-point. Technicians designed ODSS to track and trend the measures and results called for in the criteria for Organizational Excellence (AFI 90-501). By doing so, ODSS becomes the primary tool to measure, review and improve organizational performance. Exhibit 5 illustrates how ODSS's metrics module is implemented—creating a hierarchy of indicators.

### EXHIBIT 5: ODSS METRICS MODULE.

Process owners and metrics OPRs from around the wing have access to update their metrics as often as required. Update frequency depends on the process and type of metric. In this sense, ODSS contains “near real time” metric data and information that can be accessed by the appropriate organizational members.

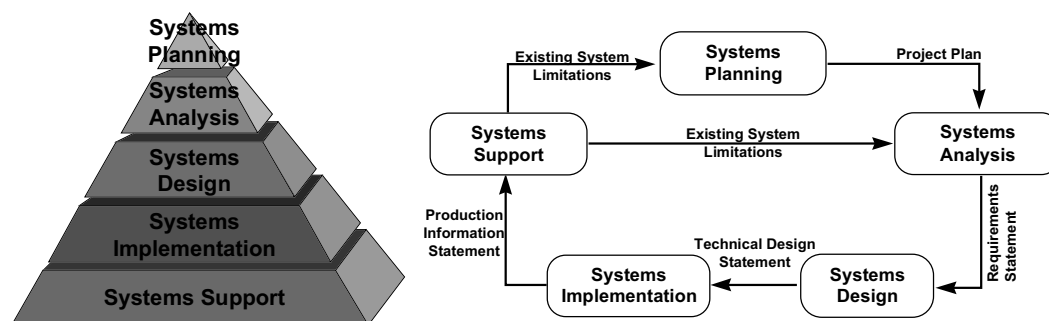
The primary beneficiary of ODSS's metrics module is senior leadership. Meetings (both number and length) to review metrics have been cut in half, giving leadership more time to concentrate on actual improvement or other key issues. The ability to conduct “drill downs” based on goals and objectives is particularly useful. For example, when the wing commander wants to review every organization that makes a contribution to wing goal number one ODSS produces the following reports:

- A list of units that support the goal and,
- A list objectives with associated links to metrics.

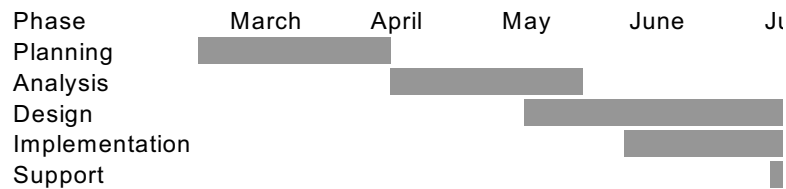
The commander can then select the metric to ascertain how the unit is progressing in accomplishing the objective. If the metric is a bar chart, or any other meaningful representation, the commander can click on it and see the next level of information. Example: A chart may depict the number of CCAF graduates per year. By clicking on the bar representing 1996, another graph showing the breakdown of graduates and degrees awarded by group or squadron will appear. Additionally, the commander can conduct “ad hoc” queries. For example, ODSS can show the commander the percentage of current customers that have completed surveys rating the organization as outstanding.

Now that we have briefly explained what our ODSS can do and, hopefully, inspired you to create an ODSS for your organization, we will describe the step-by-step process that you can use to build one.

## Building an ODSS







**EXHIBIT 6: THE MODERN INFORMATION SYSTEM DEVELOPMENT LIFE CYCLE AND NOTIONAL TIME LINE.**<sup>8</sup>

First, we recommend using a systematic approach to plan and implement the ODSS. Exhibit 6 illustrates such an approach. In short, the systems development life cycle provides a structured approach to planning an information system, analyzing existing information systems, designing a new information system, implementing a new information system, and supporting (evaluating and improving) an information system. Each step is composed of one or more steps.

### **Planning**

- Study the unit and the mission.
- Define an information architecture (e.g., databases, network, activities, people, and technology).
- Evaluate unit functions and tasks.

### **Analysis**

- Survey project feasibility.
- Study the current information systems.
- Define and prioritize user requirements.

### **Design**

- Acquire necessary hardware and software
- Select a design target.
- Design and integrate the new system.

### **Implementation**

- Build and test networks and databases.
- Build and test program modules.
- Install and test the new system (hardware and network).
- Deliver the new system into operation.

### **Support**

- Correct errors.
- Recover the system (from possible failures).
- Assist users of the system.

The first two phases of the SDLC—planning and analysis—are organization specific. For instance, you'll have to define the current information structure, evaluate unit functions, and define user requirements in relation to your organization. The conceptual design of an ODSS is a little more generic; mainly because the ODSS design stays within the bounds of today's Internet and Intranet technologies. Exhibit 7 illustrates a simplified conceptual design of our ODSS—what is going on behind the scenes, if you will.

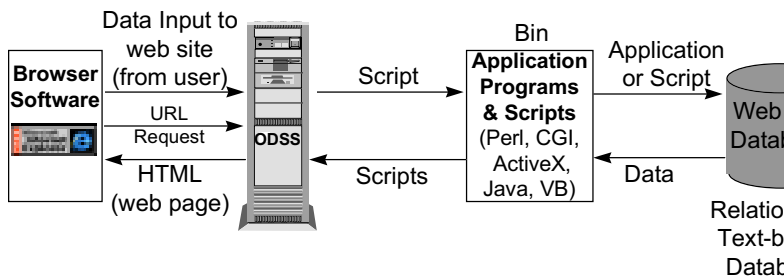


EXHIBIT 7: ODSS - WHAT'S GOING ON INSIDE THE SYSTEM.<sup>9</sup>

ODSS was designed using the latest, state-of-the-art technologies and applications available. The system is set into motion by the user. The process begins when the user's requests a URL (universal resource locator). Next, the server brings up the desired module for the user. To bring up the module, the server loads the application program, opens or creates a Web page, and sends a HTML document to the user's computer via HTTP. The user's web browser (MS-Internet explorer) reads the HTML, creating an attractive, user-friendly interface for the user. At this point, the user either enters data or requests another URL. If the user enters data, like updating a metric, he/she fills out a simple form and submits the new data. After clicking the submit button, the server invokes a script. The script either starts an application to process the input data or stores the data into the database. If the user wants to retrieve data, a metric graphic, he/she simply clicks a button on the metric input form. Upon receiving the request, the server "reaches" back into the database, pulls the data out of the respective tables/files and hands it off to the application program or script. The application or script graphs the data and sends it to the client PC in HTML format. The process ends when the user closes his/her web browser. Now that you are familiar with the conceptual design and information processing flow, let's turn our attention to the implementation stage.

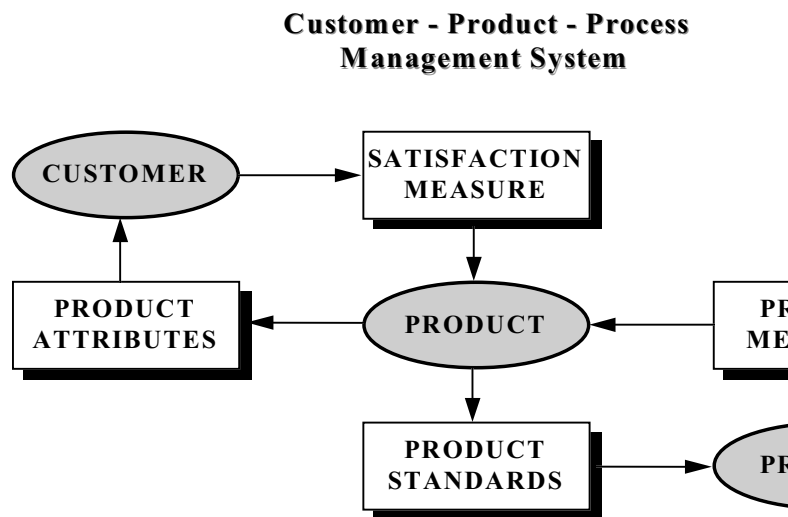
Somewhere between design and implementation you will have to buy the computer hardware and software to complete your ODSS. You will be surprised to find that you can build your ODSS and have all the benefits that accompany it for a surprisingly low investment—\$12,217 (or probably much less by now because this price breakdown is based on our 1996 purchase order under the old Zenith desk top 5 contract). Exhibit 8 shows a break down of the some potential hardware and software costs. Of course, this is only a guide, you may not need all these, you may substitute items for other items, or you may need to purchase additional items. Bottom line is to ensure you build your ODSS to suit organization's specific needs.

HARDWARE		SOFTWARE	
File Server *	\$4,211	NT Server	\$600
32 MB Ram *	\$1,343	- Personal Web Server	Included
8 GB Hard Drive *	\$1,986	- Internet Information Seerver	
4 GB DAT *	\$1,556	- Internet Explorer	
SCSI CDROM *	\$194	- Front Page	
14" Monitor *	\$360	SQL Server	\$1,400
LAN Adapter *	\$567	ActiveX Control Pad	FreeWare
		Home Site (HTML Editor)	FreeWare
		Visual Basic Control Creation Edition	FreeWare
		GIF Animator	FreeWare
		MS Office Internet Assistents	FreeWare
<b>Sub-Total</b>	<b>\$10,217</b>		<b>\$2,000</b>
<b>Grand Total</b>	<b>\$12,217</b>		

\* June 1996 Zenith Prices (actual costs may be considerably less now)

EXHIBIT 8: ODSS - HARDWARE AND SOFTWARE COSTS.

P-P model is illustrated in **Figure 1**.



**Figure 1**

There are four main flows of information in the Customer-Product-Process (C-P-P) management system: *product attributes*, *product standards*, *process measures*, and *customer satisfaction measures*. This system outlines how our metrics are based on product attributes most important to customer satisfaction and how measures for the delivery of our product are derived. Product delivery standards associated with process measures are then established to monitor process performance. At the Center level, the focus is on product attributes and unit cost. Performance in meeting the standard for each product attribute is a measure of process effectiveness, and unit cost is a measure of business efficiency. Customer satisfaction data is used to ensure that we are pursuing the right product attributes/standards in our operational objectives.

The focused C-P-P management system model, **Figure 2**, further illustrates the linkage between the customer, product, and process. The customer indicates their degree of satisfaction with product attributes through customer surveys, customer interviews, or through participation in customer focus groups. Production delivery standards monitor the ability to provide the product within measurable standards determined in consonance with customer expectations. The system of process outputs that result in product output is monitored to determine process effectiveness, or, in other words, is the process capable of operating at optimum effectiveness and efficiency and meeting customers' needs? To ensure that the right attributes are measured, customers are surveyed to determine not only their satisfaction with a particular product attribute but their perception of the importance of each attribute as well.

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## C-P-P Management System

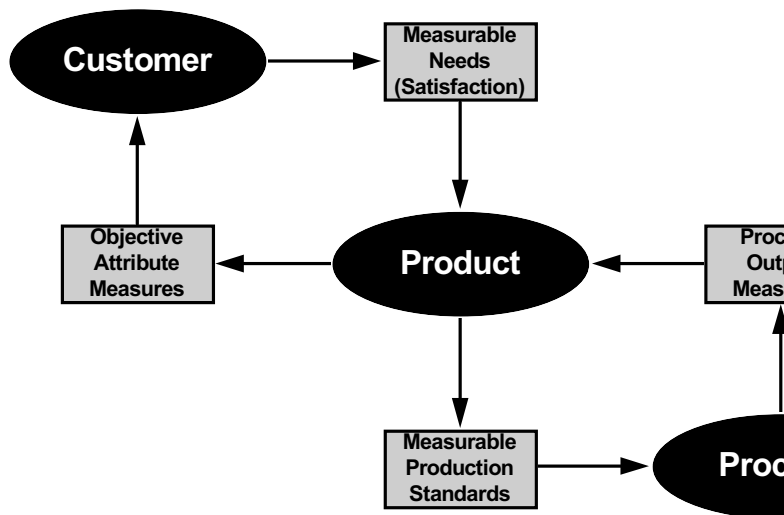


Figure 2

### • AFDTC METRICS ARCHITECTURE: THE KEY

An overview of the AFDTC Metrics Architecture is the key to understanding the application of the C-P-P Management System. AFDTC has three groups of business metrics: Strategic, Operational, and Organizational Health/Corporate Responsibility (OH/CR). The AFDTC Metrics Architecture is illustrated in **Figure 3**. **Operational metrics provide the foundation for the C-P-P model.**

*Strategic Metrics* include two types of indicators — strategic targets and quality performance indicators (QPIs). Strategic targets are derived from the AFDTC strategic planning process. QPIs are directed from AFMC/CC and reported as comparisons across all AFMC bases at Command Mission Element Board (MEB) meetings.

*Organizational Health/Corporate Responsibility Metrics* measure a variety of indicators pertinent to the regulatory and community responsibilities of AFDTC.

**Operational Metrics** measure the progress in achieving operational results and are supported by process diagrams. These metrics are the key to the AFDTC business management system. **Each of our products is characterized by product attributes based on what is most important to our customer.** Process measures for delivery of the product are then derived for each product attribute. From process measures it is then possible to develop minimum performance standards for each product metric. As stated earlier, the objective of Operational Metrics is to ensure customer satisfaction by controlling operational performance.

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AFDTC established a comprehensive program to identify its key products and processes. This hierarchy of products has been created through a series of refinements beginning with identification of key product groups and key products within each group. The need for being able to identify key products or services results from the fact that knowing what product or service you produce helps in identifying your customers, customer requirements, competition and other processes. It is essentially the first step — what do I produce?

Key products are those which are significant enough to the AFDTC mission that review of data relevant to these products is accomplished by the Center Staff. This review revolves around product attributes that are important to the customer and cost measures that are important to business efficiency. Further refinement is on-going as work units determine product elements, key processes, and the activities and tasks required to accomplish each process. Processes are documented by the process owner via a variety of methods, i.e., continuity folders, tree diagrams, flowcharts, handbooks, office instructions, and guides.

## • **PRODUCT BASED**

AFDTC has identified 94 key products that are most important to our customers. These 94 products enable our employees to focus on those products that are of primary importance to our customers and serve as the reason for our existence. Operational metrics measure three categories of operations and align with the AFDTC organizational structure. The three categories are: Technical (functions within the 46th Test Wing), Host Base (functions within the 96th Air Base Wing), and Business (focused on AFDTC staff functions). At the operating level (Group and below) we control our production processes by monitoring objective process measures for each of our 94 key products. Operational metrics measure performance at the key product level in terms of product attribute performance and unit costs. Operational descriptors have been developed for each of the key products. The operational descriptor provides a statement of what the customer expects in terms of the product attributes most important to them, a measurable product delivery standard determined through customer input, and the process performance (output) measurement.

## • **CUSTOMER FOCUSED**

The customer is the heart of everything we do at the Air Force Development Test Center. Without our customers, we would have no basis for our mission. Past, current, and potential customers define our business. We recognize and capitalize on potential markets by identifying patterns of customer requirements. By using the Customer-Product-Process (C-P-P) management system, we align the product and the processes with our customers' expectations. AFDTC's customer focus facilitates meeting customer commitments, increasing our customers' knowledge, and building co-operative relationships with our customers that lead to customer satisfaction.

AFDTC determines near-term customer requirements through direct contact by either face-to-face or telephone interviews, and other survey methods. The central strategy is to utilize information derived from the customer to define our products. This external focus identifies customer attributes—what makes the customer happy.

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## • PERFORMANCE DRIVEN

Since the most important product attributes defined by the customer can be traced to a specific task or sub-task, objective process performance (output) measures can be established and monitored to ensure performance goals are met. If performance measures are not meeting customer expectations for that product attribute, a customer focus group or process action team is assembled to focus improvement efforts in the area of unacceptable performance. Process performance measures are maintained for the two most important attributes identified through customer feedback. These output performance measures are monitored to identify process performance trends (positive and negative) that impact our customers. When an adverse trend is discovered, team action is initiated to identify root causes and effect process improvement.

## • PRODUCT TAXONOMY: LINKING WORK ACTIVITY TO THE CUSTOMER

The basic premise in providing a product is: If you deliver a product that meets the customer's needs, the customer will be satisfied! The question then becomes one of linkage. This linkage can be described by the term "taxonomy." As defined below, taxonomy is a systematic classification or division into ordered groups or categories.

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### " tax·on·o·my

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**n.**

*pl.* tax·on·o·mies

1. The classification of organisms in an ordered system that indicates natural relationships.
2. The science, laws, or principles of classification; systematics.
3. Division into ordered groups or categories

The term "process" can be defined as: The sum of the work activity required to produce a product. By integrating the definition of "taxonomy" with the definition of "process", we can define basic product taxonomy as: The systematic classification (of work processes) into ordered groups or categories, that, when joined (sum), result in a product.

Taxonomy, as defined above, is the classification of organisms into an ordered system that indicates natural relationships. In the case of products, we can apply the taxonomy principle to illustrate the natural relationship that exists between a customer, the product provided to the customer, and the process by which the product is determined to meet the customer's expectations. Product taxonomy is illustrated in **Figure 4**.

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**Figure 4**  
**C - P - P SUMMARY**

- **CUSTOMER**
  1. Has pre-conceived product/service expectations
  2. Communicates perceived satisfaction with products/services via customer survey
  3. Identifies most important product/service attributes
- **PRODUCT**
  1. Product/service provider verifies attributes most important to customer
  2. Identify product attributes and process performance measure for that attribute
  3. Develop product delivery standards based upon customer requirements
- **PROCESS**
  1. Gather and monitor key attribute process performance data
  2. Analyze key attribute process performance data for trends
  3. Focus improvement efforts in areas of substandard performance







### **Staff Sgt. Yens E. Jacobs**

SSgt Jacobs is the NCOIC, Quality Assurance at the 743d Maintenance Squadron, Pope Air Force Base, North Carolina home of the 43d Wing. He is responsible for providing technical guidance, assistance, and problem solving research to the maintainers of the 743 MXS.

Additionally he is responsible for the construction and maintenance of the 743 MXS Intranet, 743 MXS Internet site, member of the Pope Electronic Information Working Group, and maintains a personal site called “Yseesee”.

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# Running Organizations Minimizing Paper (ROMP)

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**Staff Sgt. Yens E. Jacobs**

*743d Maintenance Squadron, Pope Air Force Base, North Carolina*

## Abstract

We are in the middle of the Information age and quickly heading towards the knowledge age. This paper introduces a means of distributing information while virtually eliminating printed media. The Intranet promises to fundamentally change the way workers communicate to a degree not experienced since the telephone. The sooner an Intranet becomes a core component of an organization's technology infrastructure, the sooner the organization can reap the benefits. Our organization implemented the Intranet on 1 January 97 and has seen tremendous results. Adopting this idea will save the Air Force valuable resources and man hours in this time of down sizing. Look at your offices and think about how much paper is generated with the intent of passing on information. Add up every piece of paper that comes in and leaves your office on a daily basis, the sum you come up with may surprise you!

## ROMP In The Workplace

The "Paperless Air Force" initiative began in 1993. Thus far the Air Force has made great strides in saving tons of trees by converting most publications and forms into electronic versions. We can take this initiative one giant step forward! Is the vision of no paper in the Air Force out of our reach? One may think so as we shuffle paper, post paper on bulletin boards, and pass paper on to others. The paper trail seems endless and here to stay. Or is it? What we all want is to be able to share information with others in our organization, be it mandatory, formal, or just a friendly reminder of an up coming event. You could e-mail each person on a continuing basis. That would save paper, but would be too time consuming and not everyone has e-mail (e-mail problems will be discussed later). You could post it on the bulletin board, but which one? And how long do you post it for? If it is on the bulletin board someone needs to post it, then go back and remove it when it no longer applies and put up new information. Paper and more paper, running from here to there, nothing is saved by this!

Let's say the information is posted on the bulletin board. How do you find what you are looking for? You must search the board and scan over many bulletins, flyers, letters, articles, and other information to spot what it is you want. Often information is simply overlooked because of the clutter. Wouldn't it be nice to search for a key word to find exactly what you are looking for? If the information changes, new copies must be made and then someone has to run around and post the new changes. This method of posting information is not a very efficient process for getting the word out to many individuals. The paper way is in fact going away. Wouldn't it be nice to post information in one place where it can be easily updated, give you full color graphic capabilities, be interactive, use animation, be available to everyone, and never use one piece of paper or waste ink in the process? This can be done and it is very cost effective!

The answer to this problem is the Intranet. What is an Intranet? An Intranet is the use of

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Internet technologies within an organization to achieve better results than the conventional means of data transfer. Generally speaking an Intranet is different from an Internet in the following ways: An Intranet is a network within the organization whereas Internet is a world wide network. An Intranet has access to the Internet but not vice-versa. The Intranet helps in cutting costs while providing easy and fast accessibility of day to day information. By using a browser of your choice you can have everything mentioned above and more. You can search for any document on the entire Intranet using key words or search a specific page using the find option to find the information you want fast.

Imagine being able to pull up a page to inform you of the correct procedures to follow for taking leave. From within this page, a simple click of the mouse will also bring up the appropriate AFI concerning leaves. Now your ready to fill out your leave paperwork. Again, simply click on the hypertext link and up pops the leave form. Fill it out and send it to the printer...nothing could be simpler. The Intranet allows the user quick access to a number of program types without the need to first locate the program and then the file name and then finally view the information being sought. The possibilities are endless.

When this electronic media is no longer needed on the Intranet it can be deleted and nothing is wasted! There are many tools available that can transform a Word document, Excel file, or Power Point presentation into an Hyper Text Markup Language (HTML) document so it can be viewed by any browser that you choose.

### **Information When Your Customer Wants It**

Being able to access information 24 hours a day, 365 days a year is a big advantage to the individuals in your organization. There no longer is the need for many individuals to come in after their normal duty time or come in on their time off to get information that they need. There are many times that you may have a question about something that requires you to go to another section for the answer. Putting the Frequently Asked Questions (FAQ) section in the Intranet will save the leg work that people in the past had to go through just to get an answer to a simple question. Why run around and try to find the information you need when you can search for it on the Intranet. There are many times that someone just needs to know the hours or times that something is going on in their organization and the person who has that information is not available.

The Intranet can be the one place in the organization that can store all the information that people are looking for. Each section or office can have a spot on the Intranet where they can put information that deals with their office or program. The data stored on the Intranet can be very specific or general. This gives you the chance to work directly with the customer to find out what it is they would like to see on the Intranet. The whole reason for the Intranet is to make finding the data or information for the internal customer easy when he or she wants it. The connection between customer and supplier can be achieved whenever the need arises. Hypertext links simplify navigation and information retrieval.

### **Providing The Information Seeker Multi-Media**

The ability to add graphics, backgrounds, and pictures to the Intranet is just one of the

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many ways that a page can be greatly enhanced. I'm sure you have heard the phrase "A Picture Is Worth A Thousand Words", this is true in this type of environment. By adding art to the text makes the page of information more pleasing to the eye of the viewer. (If the computers support sound that too can be added to the page.) You could leave a recorded message or simply play music in the background for your customer to enjoy. Today, World Wide Web traffic outdistances all other traffic on the Internet and the increasing use of graphics, audio, video, and other data types on the Internet servers will continue to drive growth. Similarly, the Intranet is a powerful mechanism to make more information readily available.

There are reports that people are using the Internet as a way of wasting time and doing nothing more than surfing. Why not use this technology and let your people surf the Intranet to learn more about their own organization? An increasing number of workers gain access from their work desk every day and are becoming accustomed to retrieving information through the now ubiquitous browser. This can be done by using a browser that does not give everyone access to the World Wide Web.

## **Save Time**

How can Intranets save you time? Most organizations are run by people working together. How do your employees communicate? By phone, voice mail, e-mail, fax, or person to person meetings?

An Intranet can cut down the time your employees spend on routine communication tasks. If you are using e-mail internally you already know the benefits over trying to get someone over the phone. The one problem with using e-mail is that the entire message is usually not conveyed in the first communication. One e-mail starts a string of e-mails back and forth until the person completely understands your request or message. Many times, this e-mail tag turns into a phone call to get the true meaning of the e-mail across.

How much time do your employees spend answering frequently asked questions? Would you like to cut down the time? Put the information on the Intranet. Don't just put it out there, refer all your calls from other offices and your internal customers to your Intranet.

Do your employees spend time chasing paper? Trying to hunt down forms, reports, documents, telephone numbers? Consider converting these documents to electronic formats using scanners, Optical Character Recognition (OCR) or Intelligent Character Recognition (ICR) software, or other means. Once users know how easily accessible these documents are using the Intranet, they will prefer the faster solution. Result? You save time, resources, manpower, and finally paper.

## **Intranets Reduce Cost, Time to Market**

Just as importantly, Intranets dramatically reduce the cost (and time) of content development, duplication, distribution, and usage. The traditional publication model is a multi-step process including:

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- creation of content
  - migration of content desktop publishing environment
  - production of draft
  - revision
  - final draft production
  - duplication
  - distribution

The Intranet publishing model includes a much shorter process, skipping many of the steps involved in the traditional publication model:

- creation of content
- migration of content to Intranet environment

In this latter model, revision becomes part of the updating process while the original content is available to the end user, thus dramatically reducing the time it takes for the information to become available to the user of that information. As the information is centrally stored and always presumed to be current, the organization will not have to retrieve “old” information from employees to be replaced with new information, thus saving any expense incurred in updating. This new publishing model will dramatically reduce both the cost and the time frame involved. Intranet servers can run on platforms widely found in most organizations (Intel 80486 or Pentium class computers) so that little if any additional infrastructure is needed.

## Getting Started

The first step in building an Intranet is to identify a likely area for deployment. A quick sampling of the paper flow within the organization may point to a likely candidate, whether it be the organization newsletter, human resources, training plans, flow charts, continuity book, etc. The more ambitious may want to look at information needs and build an information flow strategy from scratch. This first step will give you a relatively good insight as to how large the Intranet will be. Keep in mind that as your Intranet grows, the possibilities will become more apparent. The Intranet should grow as time goes on and more people begin to realize other uses.

The second step is to identify the content source or author - the person actually responsible for the intelligence behind the information and getting it into the digital format. Should this person be responsible for “HTMLizing” the information? We have found that the basic HTML page can be built by the most knowledgeable person and the actual maintenance of the page (changing data etc.) can be done by the author or source of the information. The person updating the data or information will begin to understand the basics of HTML by doing this. They will soon be able to create pages on their own especially if a basic page template is available. You could even add a training guide to the Intranet for those individuals interested in building pages. Another idea is to have a person responsible for converting non-HTML documents quickly using a pre-defined template for consistent organizational style. How and who will do any of the above mentioned tasks can be determined by a simple poll of the organization. Many times individuals can be found that have a good understanding of HTML or may have a strong desire to learn.

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## Likely Content

Organizations must determine whether the information should be made available via an Intranet server, via e-mail, or through other means. Here are a few items you may want to consider putting on the Intranet: organizational chart, commonly used phone numbers, upcoming events, newcomer's briefing, tips of the week to include: safety, best practices etc., mass appointments such as dental and hearing exams, staff or meeting notes, newest members to the organization to include a photo and brief biography (see Attachment 1 for an example of our Intranet infrastructure). As you can see by the list above, there are many candidates for this application. By now you have surely thought of a few items unique to your organization that can be applied to this zestful medium. In these instances, it is important to focus on the value of enhanced access to information. Have you ever found yourself putting people on hold or telling someone that you don't have the information and referring them to another office? Have you ever looked for a phone number or a flyer so that you could pass the information on to an individual on the phone and not being able to find it? A quick search of the Intranet can put the information at you finger tips.

## Challenges

The technical capabilities of the Intranet bring up certain organizational challenges, including but not limited to:

- Security
- Privacy
- Currency

Each of these issues, and many others, can be resolved through careful planning and implementation of the Intranet strategy.

## Security

Security can be defined as providing access by the appropriate personnel to the correct information, while at the same time barring access to all others. Most popular servers today allow such access configuration on a user/group basis. Some in fact, allow the system administrator to go far beyond this, allowing them to limit access rights by specific IP address for individual pages. Users and group access can be managed with programs such as Windows NT or Novel.

Security of the local area network within the organization's infrastructure and from the Internet is an important issue. The easiest way to eliminate the threats from the Internet is to use an off-line browser that does not have Internet access nor does it open the Intranet to infiltration from it.



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## **Privacy**

Privacy is largely an organizational issue. The amount of information and the number of request need to be well thought out when approaching this issue. If there is not or their never was a real demand for information that falls into this category, don't use it in the Intranet. This is the only way to guarantee its safety. If there is a real need to for access to this type of information and you want to include it on the Intranet, working closely with the system administrator is my best advice.

## **Currency**

While Intranets allow information to be updated instantly, by no means do they guarantee currency. Publishers must be committed to keeping the Intranet site up to date, and certain steps may be taken to ensure consumers of the information use it appropriately. Simply putting the "date and time of the last change" on each page will help tremendously in this respect, allowing the user to check ensuring the information is indeed current.

In addition, certain pages, such as meeting minutes, matrices, etc., should have regular updates or "refreshes" scheduled, along with someone identified to provide instant updating as soon as new information is received. In this way, individuals can trust that the information represents the most current information available.

Other steps, such as providing e-mail address or telephone numbers of the author, can further assist in the use of the information, as users will be able to request further information or clarification on specific points of interest.

## **Tools Used**

A number of basic Internet publishing tools making the Intranet possible. First, in addition to the web browser, web servers are available for a variety of platforms found in the typical organization, including all levels of Windows, Unix, OS/2, and many others. This general availability allows publishing from virtually any computing environment.

Second, an increasing number of tools empower the user to create HTML for the Intranet application. Many, if not most of the popular word processing packages, allow documents to be saved as HTML, and tools are beginning to enter the market at an increased rate that allow for large scale migration of content from the traditional word processing format to HTML (MS Back Office is just one example). These tools allow the non-sophisticated user to continue to create content in their familiar applications and to move this content to the server without having to manipulate each file or document.

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## Summary

In summary, the application of Internet technologies in an Intranet setting can dramatically increase the flow and value of information within an organization. Users can gain quick and timely access to a much wider variety of existing information residing in a variety of original forms and sources, ranging from word processing files, to data bases, notes, and other resources. In addition, traditional paper-based information distribution can be displaced by Intranet applications, lowering costs, and increasing the timeliness of information flow.

Finally, Intranet applications can start as small sites and scale upwards over time, gradually providing or facilitating access to an ever increasing breadth of information, improving both employee productivity and satisfaction, and ultimately bolstering the organization's information distribution program and implementing ROMP.

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### **Major Brian R. Kelley**

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# Air Force Productivity Programs: Shaping Our Future through Resource Allocation

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**Maj. Brian R. Kelley**

*PACAF Quality and Management Innovation Flight*

## ABSTRACT

This paper examines the Productivity Enhancing Capital Investment (PECI) programs used by the United States Air Force (USAF) to improve capability and readiness while reducing resources. These programs provide USAF organizations with funds to make capital investments which, over time, save money and manpower. The paper explores several approaches available to USAF major commands for the recoupment of invested funds from the organizations, the impact of each approach on the attractiveness of the investment to the organization, and the optimal reinvestment of recouped funds. The paper also discusses the use of payback period as a qualifying factor for program investment, other factors to consider in selecting investment opportunities, and the need to maintain fixed rules for resource repayment during the execution of a PEGI project.

## INTRODUCTION

The Air Force, like nearly all organizations, consumes resources (money and labor) in the execution of its mission. Today, the Air Force's ultimate customer, the American public, demands greater efficiency in the accomplishment of our mission than ever before. This demand is two-fold: absent a superpower threat, the public will not tolerate either large defense budgets or results less successful than the rapid, one-sided victory that we experienced in the Gulf War. In order to shape the lean, lethal force these requirements drive, the Air Force has continued and expanded its quest to improve productivity through a variety of initiatives including self-assessment, suggestions, and outsourcing and privatization. Among these, the Productivity Enhancing Capital Investment (PECI) programs provide a good example of the challenges that face us in making rational decisions about our future course. These programs were created to save resources, which, properly executed, they do. But how can these savings be allocated to do the most good? This paper explores that question and examines how project selection criteria affect the benefits the Air Force reaps from PEGI.

## BACKGROUND

The United States Air Force (USAF) created the PEGI programs to "improve quality and productivity" and to "reduce unit costs of outputs in Air Force operations" (Ref 1). Specifically, these programs provide organizations with funds to invest in projects that reduce operating expenses through savings in manpower or other resources, typically operations and support (O&S) expenses. The two primary vehicles for PEGI are the Fast Payback Capital Investment Program (FASCAP) and Productivity Investment Fund (PIF):

#### FASCAP investments:

- Must realize savings equal to the investment in two years
- Are less than \$200K per project
- Are approved by USAF major commands (MAJCOMs)
- Are paid back by the MAJCOM to (HQ USAF after two fiscal years

#### PIF investments:

- Must realize savings equal to the investment in four years
- May be of any dollar amount
- Are approved by HQ USAF
- Are paid back by the MAJCOM to HQ USAF after four fiscal years

The economic lifetime of the equipment purchased and annual savings are the basis used to estimate the total savings the Air Force will realize through the investment. This is then used to estimate the total return on investment (ROI) the project will realize. The ROI is used by HQ USAF to prioritize PIF projects and may be used by MAJCOMs at their discretion to prioritize FASCAPS. MAJCOMs also exercise discretion in identifying options for repayment of the invested funds after amortization, returning the investment in the form of O&S dollars or manpower and in their recoupment of savings from organizations receiving investment funds. As we shall see, the approach the MAJCOM follows for recoupment from subordinate organizations has a significant impact on the attractiveness of the PECCI programs to those organizations.

#### BASIC EXAMPLE

Consider an investment opportunity that qualifies for FASCAP funding at Wing X. By investing \$150,000 in new equipment, the wing can realize annual savings of \$10,000 in O&S costs and delete two Staff Sergeant (Air Force "E-5") positions that cost \$44,000 per year each. The equipment has a lifetime of 5 years. The MAJCOM policy is not to reduce the wing's budget for either the cost of the initial investment or the realized O&S savings. Also, the manpower authorizations deleted are returned after two years. The net economic benefit for the wing can be graphically displayed (Fig 1).

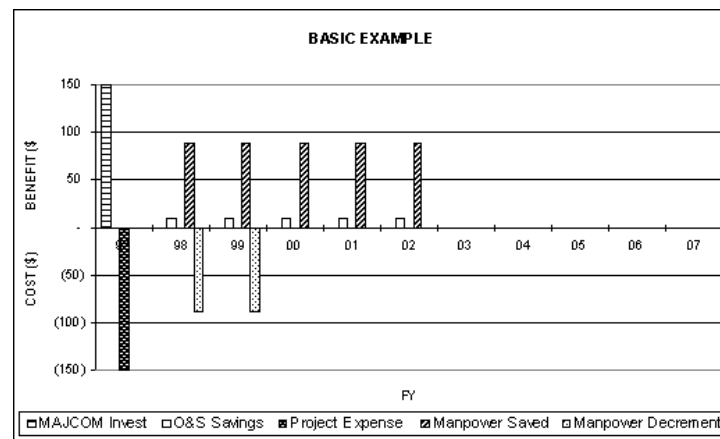


Figure 1.

The funds were provided by the MAJCOM and spent on the needed equipment during FY97 and the system became operational on the first day of FY98. Manpower savings were realized throughout the lifetime of the equipment, but only reflected as a decrement to the wing for two years. (If the MAJCOM required a negative variance be documented, the decrement could be made for the lifetime of the equipment or permanently.) Also, O&S savings were realized throughout the equipment's life, but were never refunded to the MAJCOM. There is no provision for replacement of the purchased equipment as part of the FASCAP program, but it could be done as part of the normal budget cycle. The net economic benefit to the wing is \$314K.

Keep in mind that the net economic benefit to the Air Force (and eventually the taxpayer) is different. The Air Force invested \$150K and will receive \$440K in manpower savings and \$50K in O&S savings (reinvested within the wing) for a net benefit of \$340K. This will remain unchanged where no other savings are sought; the different methods of recouping the investment only change the relative benefits that accrue to the wing and the MAJCOM.

#### PAYBACKS AND INCENTIVES

Why are manpower authorizations returned to the wing after the project amortizes? If the rationale for deleting the authorizations were that they are not needed because purchase of the equipment has changed the functional process, one would expect them to be returned only when the equipment's economic life is over. Figure 2 is a graphical depiction of this option, which reduces the benefit to the wing to \$50K, the value of the operational cost savings alone.

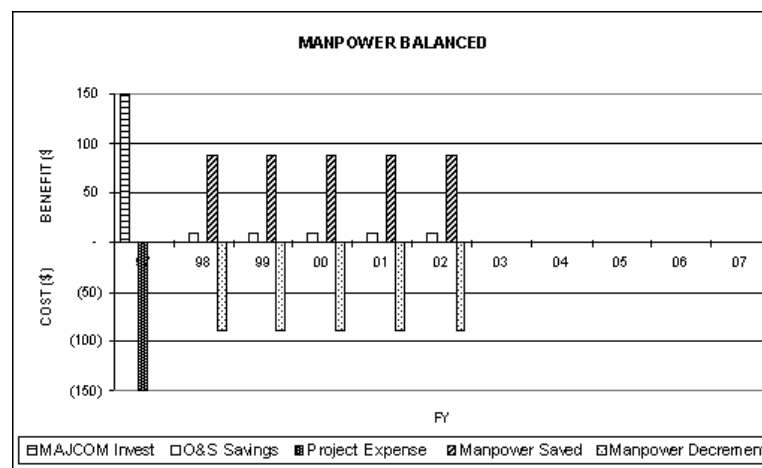


Figure 2.

Taking this logic a step further, consider the rationale for requiring a payback of the O&S savings themselves. Every dollar allocated to a wing, or any other Air Force organization, is presumably tied to a mission-related expense. Those resources saved by adopting more efficient practices should then be reallocated where they will best benefit the Air Force. That best use of resources may or may not be within the wing where the savings were made, which explains why some MAJCOMs use manpower savings to fund their unfunded requirements. For that matter, the best use of the saved resources may not be within the MAJCOM. If both manpower and O&S costs were balanced, the project would become resource neutral to the wing. The only incentive for

wing leaders to seek these investment opportunities would be the recognition and compensation provided to them and their organizations as individuals and teams. The resources saved would be available at a level where they could be applied to do the most good. Figure 3 shows this option, where O&S savings are returned to the MAJCOM as a project expense.

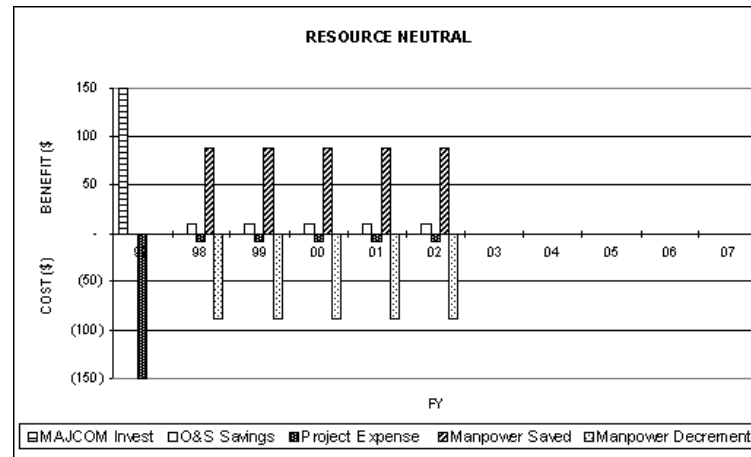


Figure 3.

Another alternative a MAJCOM can use is to link the Peci (a good deal) to an arbitrary reduction in manpower (a bad deal). Consider an arbitrary reduction of two Staff Sergeants starting in FY00. Through FY07 it would represent a net loss to a wing of \$704K (Fig 4).

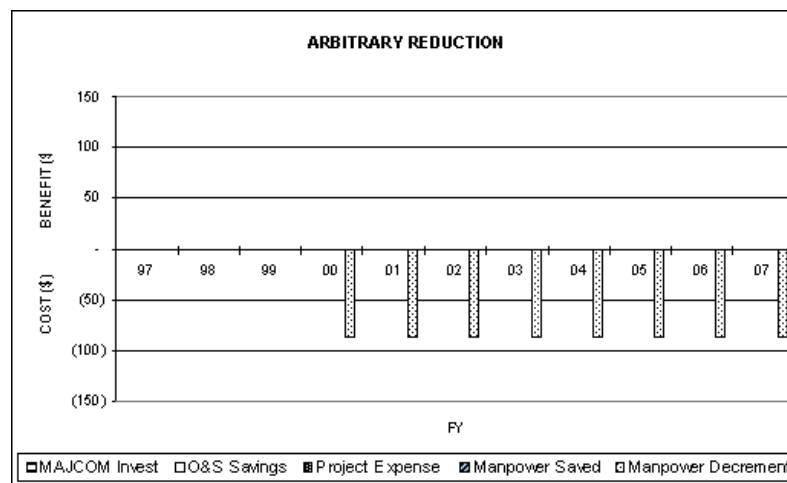


Figure 4.

Needless to say, this looks rather disadvantageous from the wing's perspective. But link it to the original example (Fig 1) where the Peci decrements manpower in FY98 and FY99, and it is somewhat more palatable over ten years (Fig 5), costing the unit only \$390K during that period.



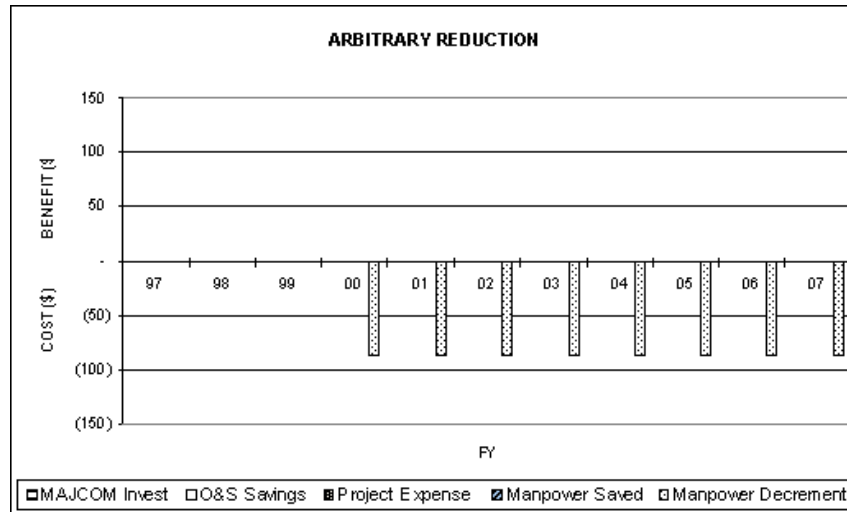


Figure 5.

One fallout of a MAJCOM policy that takes away manpower permanently as a hedge against future manpower reductions is the decided preference (at the wing level) for projects that save O&S costs, if they are kept by the wing, rather than manpower, which is forfeited. Also, this arrangement requires foresight by wing commanders. Note that this approach provides a net benefit to the wing during the economic life of the equipment, and is only a liability thereafter. A shortsighted commander could fill his base with new technology that saved lots of resources and leave his successors to face the consequences as the machines wear out. One remedy to this would be to make the project revenue neutral during the equipment's economic life through payback of saved support costs. The net effect would then be a delay of arbitrary manpower reductions through PECE. Another option would be to institutionalize a process for replacing equipment at the end of its economic life using funds from outside the wing.

## OTHER ISSUES

A fundamental issue confronting the Air Force in implementing PECE is that of using payback period as a qualifying criterion in selecting projects. The author was surprised to discover that payback period was the fundamental qualifying factor for selection of investment opportunities. His limited exposure to selection of investment opportunities was in an academic environment that considered corporate investment strategies. In the corporate world, return on investment is the cornerstone measure of suitability. In fact, the author's undergraduate engineering economics text (Ref 2) specifically disparaged payback period as a criterion for selecting projects. The text said payback period is "undesirable" as a study method, "can produce misleading results," "does not take into consideration the economic life of the physical assets," and should be avoided except as "an indicator of project risk". Payback period is simply a less accurate measure of net economic benefit than return on investment.

A plausible rationale for using payback period is the pace at which our mission can change due to geopolitical, political, or technological factors. Investing through PECE presumes a commitment

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to continue performing the process for which the equipment is to be purchased. A fundamental condition of financing the initiative using PEGI is that the requirement will exist at least long enough to amortize the investment through savings. (Preferably, the requirement will exist long enough to realize a return that makes the investment superior to alternative projects under consideration.) Of particular concern is the possibility that the organization will trade flexible assets (money and manpower) for a less flexible asset (a specific piece of equipment) in an environment of changing requirements. In addition to being used for mission requirements, today's fiscal environment drives managers to consider the threat of arbitrary reductions in money or manpower as a future "demand." There is no point in making long-term investments to improve efficiencies in a process that reductions will cause you to abandon altogether in the near future. A broader, and more dangerous, possibility is that organizations might shun investments such as PEGI completely until forced to; fat organizations can withstand arbitrary reductions better than lean ones.

Another issue is the identification of factors beyond economic ones in selecting and prioritizing projects. Although productivity improvement is typically approached in purely economic terms, our ultimate output, combat capability, is difficult to measure from a purely economic standpoint. Most candidate PEGI projects seek to improve productivity by accomplishing the same mission (same output) using fewer resources (less input). However, some projects may provide an ancillary increase in combat capability, flexibility, or quality of life that, coupled with savings in resources, make them our best candidates for funding. Considering these intangible factors as tiebreakers among projects with comparable economic returns is one method to ensure they are not overlooked.

Although this paper discusses a variety of options related to project selection and recoupment, fixed ground rules are needed for the actual execution of the programs. MAJCOMs (in concert with subordinate organizations) should establish criteria for soliciting, prioritizing, and selecting FASCAP projects. Further, provisions for recovery of resources in place at project approval should be considered a contract between the provider and the organization; the rules should not change in the middle of the game.

## CONCLUSIONS

Arguably, the very existence of PEGI programs highlights the Air Force's inability to rationally allocate resources. Like the character in a Dilbert cartoon who questions the "special program to empower employees"--if they were really empowered they wouldn't need a special program--an observer might ask why the Air Force needs a special program to increase productivity. Obviously, commanders at all echelons are not yet sufficiently motivated through institutional reward systems to increase productivity or are simply unable to measure it well enough.

Today's commanders rely on an abstract jumble of measures to grade the performance of their own organizations and subordinate ones such as: infrequent ORIs, mission capable rates, reenlistment rates, soft measures of quality of life and community support, and so on. Ultimately, the solution to this problem lies in improving our ability to measure our performance. Only when we have a sound basis for measuring output will commanders be able to view resources as expenses and be both willing and able to improve productivity.

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Until then, of course, we must muddle through. PEGI programs have done, and will continue to do, some good. Recoupment strategies that strike a balance between incentives to individual units for participation and optimal redistribution of resources should be implemented. Strategies for selecting projects should look primarily at economic factors, especially return on investment, but remain sensitive to our overall objectives including mission performance and improving the quality of life for our people.

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### **CMSgt Richard R. Kreutzer**

CMSgt Richard R. Kreutzer is a career aircraft maintainer assigned to the C-141 System Program Office at Robins Air Force Base. His experience includes work in base level maintenance and quality assurance, major command headquarters logistics support, and depot level maintenance and logistics. His education includes a bachelor of science degree in business management from the University of Maryland and an MBA from Georgia College and State University.

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## *C-141 Readiness Equation*

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### **Abstract**

This paper portrays the C-141 System Program Office (SPO) Readiness Team's efforts to improve support to their customers. The team, consisted of six supply and three maintenance personnel and was formed to improve the readiness and sustainment of the C-141 aircraft fleet. The primary driver for sustaining the C-141 and maintaining readiness is ensuring aircraft spare parts are available when the war fighter needs them. They discovered the data and methods they were using to monitor availability of spare parts did not accurately reflect the impact parts shortages have on their customer. The process was also very slow. To correct this situation, the team reached out to their customer to pull information regarding aircraft spare parts support. Once they determined how to get the data they needed, they formulated an equation to evaluate the data which allows Air Logistics Centers (ALCs) to focus their efforts on the most critical spare parts. Then they had to overcome existing mind sets to get approval to use the new process. They were successful in doing so and their methods will soon be automated and incorporated into Air Force Materiel Command's Weapon System Management Information System (WSMIS) Sustainment Assessment Module (SAM). Since the team began using the new process, C-141 MICAP hours (MICAP stands for mission capable and indicates hours aircraft could not fly because parts were not available) have decreased over 40 percent, parts cannibalizations are down almost 50 percent, and mission capable rates are averaging four percent higher.

### **Discussion**

The Readiness Team started with the premise that there should be a method of determining a single list of critically short (low supply levels) parts, prioritized by severity on the war fighter's mission. Unfortunately, the method of determining which items were critical consisted of looking at a series of "Top 10" lists, sometimes as many as ten different lists, comparing them, and then negotiating an overall "Top 10" list with the lead command—Air Mobility Command (AMC). This process was supposed to happen quarterly, but as it took more than three months to complete, it was highly inefficient. Further, the result of this complicated process was an unprioritized list of 10 to 30 parts that did not indicate where to apply limited manpower and funding.

The team was certain they could improve this process. First, they went to their customers to determine what was important to them. Looking at criticality from the war fighter's standpoint meant the team had to get "outside the box" and look at non-traditional data sources. The customer's involvement revealed three non-traditional sources of data:

- 1) They found that cannibalizing (CANNing) parts from plane to plane was not only a waste of their customer's manpower and money, but many parts were difficult to CANN and lowered the morale of maintenance troops. To get accurate data on the number of times parts were CANNed and the number of hours required to CANN them, they gained access to the customer's G081 Maintenance Management System. This allowed the team to put more

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focus on the “hard to CANN” items requiring several hours to remove and replace versus “easy 15 minute” CANNs.

2) The team also found that the war fighter “lives” out of the readiness spares package (RSP) kits (several thousand different spare parts) not only in war, but also during peacetime and contingency operations. As these are all mission essential parts, keeping the RSP kit full is very important. After several months of effort, the team was able to download a custom report from the Standard Base Supply System (SBSS) database giving the RSP fill level for every individual kit item. Since RSP kit levels drop before significant MICAP hours accumulate, monitoring RSP levels monthly provided the team advance notice of potentially critical parts problems.

3) Finally, the Air Force is retiring C-141 aircraft and sending them to the Aerospace Maintenance and Regeneration Center (AMARC) or “bone yard.” AMARC, similar to an automobile junk yard, is a parts source in times of critical need. By tracking parts pulled from AMARC, the team found another good leading edge indicator of parts that may become fleet wide grounding items.

The team evaluated the new and traditional data with their customer and then assigned weights to each type of data (factor) according to its importance to the war fighter. They then developed a formula to combine all the factors and produce a total “Readiness Score” for each part—the higher the score, the more critical the part is. The formula was developed empirically and improved over months of discussions with the customer and functional experts throughout the Air Force.

RSPO = the quantity of a particular part on hand in the RSP

RSPA = the quantity of a particular part authorized in the RSP

CANNs\*HOURS = the number of CANNs (includes parts pulled from AMARC) for a particular part times

the number of hours it takes a mechanic to remove and reinstall it

MICAPS\*HOURS = the number of MICAP incidents for a particular part times the number of hours aircraft were MICAP for this part

GRDACFT = the number of aircraft WSMIS projects will be grounded for a particular part after the C-141 fleet has flown in a wartime scenario for 30 days

To use this formula, deemed “The Readiness Equation,” the team compiled a list of parts (for one type aircraft) for the past month that registered MICAPs, had been pulled from AMARC, were CANNed, were short in the RSP kits, or WSMIS SAM projected would ground aircraft before day 31 of a typical war. These parts were then entered into a spreadsheet which calculated the score for each factor for each part and totaled the score for each part to produce a single list of problem parts ranked by order of severity to the war fighter’s mission. Using the list, the team could literally take their limited resources of manpower, money, and time and begin applying them to the most critical parts on the top of the list and work their way down. In addition, tracking the resulting “score” from The Readiness Equation month-to-month enabled the team to determine if a “sick” part was getting better which would be indicated by a decreasing score. If the score was not decreasing, they could easily find the reason based on the equation factor having the most impact on the overall score.

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Next, they expanded use of the equation to the other ALCs so other sources of supply would know where the C-141 parts they manage fall on the criticality list, thus allowing them to focus their efforts properly. This also provided the C-141 System Program Director (SPD) an accurate way of determining how well each source of supply was doing in fixing their individual problem items. The equation allowed the ALC teams to focus their day-to-day operations on the same prioritized list and therefore become much more efficient. Consequently, the monthly lists (one single list per month versus up to 10 lists previously) produced by the equation have become the basis for quarterly negotiations with the command (the customer) as to what items should be added or deleted from the critical item program. The negotiation process is now very simple and straight forward.

The team began using the equation and focusing on real mission limiting critical items in October 1995. Since then, the C-141 fleet is averaging over 40% less MICAP hours per month.

In addition, a strong focus (weighted into the equation) on improving stock levels for those parts with too many CANNs has reduced CANNs per month by almost 50 percent.

A direct result of reducing MICAP hours and CANNs is improving mission capability. The monthly C-141 Mission Capability Rate (percentage of the fleet that is able to do its mission) is averaging almost four percent higher than normal. The bottom line is the war fighters have more aircraft to perform their mission.

There has also been a significant reduction in the time it takes to prepare for the many (up to 10) reviews the potential critical items get, both at HQ AMC and WR-ALC. Instead of preparing lists and responses for the different lists, there is now only one list. The man-hour reductions that HQ AMC alone reported are 90 percent, from over 360 man-hours for three weapon systems per month to under 36 hours.

## **Conclusion**

The accuracy and effectiveness of the C-141 Readiness Equation can be attributed to the team getting their customer involved during design of the new process. For years AFMC had attached little importance to CANNs and the impact they have on their customer's mission readiness. The customer's input emphasized the need to measure CANNs and helped the team determine the means of measuring and utilizing CANN data. Similarly, withdrawing parts from RSP kits was common practice but had little impact on SPO actions until the kits were empty of a particular item, and customers began grounding aircraft for lack of this item. Once again, customer involvement allowed the team to understand RSP operations and the importance of these war time kits during day-to-day operations. The improvements are also related to the simplicity of the process, the visibility of parts problems provided by the process, and the focus of ALC resources allowed by using the new process. Prior to development and use of the Readiness Equation, the team was forced to sift through numerous parts lists that were basically rankings of MICAP hours prioritized by special interests of different groups. The team developed a process to rank critical parts which was based on their customer's needs. The process produced a single accurate list allowing all centers to focus their efforts in unison and to monitor their progress.



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# PERFORMANCE-BASED GOVERNANCE (A SYSTEMATIC APPROACH)

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**Tech. Sgt. David E. Crabtree, Ms Esther Krowel**

*21st Support Group, Peterson Air Force Base, Colo.*

## Abstract

The need to develop a systematic approach for improving mission performance is the fundamental responsibility of senior executive leaders and necessary if organizations are to become successful. It is the cornerstone in which successful organizations build upon. Driven from the top-down, a systematic approach involves true understanding of management systems and their relationships.

This paper presents how the 21st Support Group, Peterson Air Force Base, Colorado, applied a system approach to dramatically improve their mission performance and planning process. It involved a systematic process that addressed compliance, internal work environments, customer-driven operational results, performance indicators, and continuous process improvement. This type of management system, commonly referred to as performance-based governance, favors management system indicators versus process improvement measures in determining how well you are doing and how do you know. Other benefits were realized and numerous organizations have benchmarked this best practice.

## Background

At the federal level, the movement toward a systematic approach became evident through the Government Performance and Results Act of 1992 (GPRA). The GPRA requires federal agencies to develop strategic plans that include mission statements, goals, and objectives. These agencies are required by public law to report progress toward goals with result-oriented performance measures. Result-oriented performance measures are derived from the organization's key management systems.

A management system takes into account all critical performance measures related to that particular system. These measures are linked to the organization's mission, goals, and objectives. This approach assumes that it is more important to measure outcomes or results based on leadership action, as opposed to process improvements. In some federal circles, this approach is commonly referred to as performance-based governance (Coopers and Lybrand L.L.P., 1995).

The fundamental baseline in determining organizational excellence through a systematic approach is best exemplified in Mark Graham Brown's Baldrige Award Winning Quality: How to Interpret the Malcolm Baldrige Award Criteria, fifth edition. The Air Force has taken Brown's methodology and adapted it to its use through Air Force Policy Directive 90-5, *Quality Air Force* and Air Force Instruction 90-501, *Criteria for Air Force Assessments*. Simply stated, a systems approach is how the organization assesses its performance and customer satisfaction. Properly deployed, a sound, systematic approach will be evident throughout an organization through its management systems.

## Discussion

The 21st Support Group senior executive leadership had struggled with quality terms and implementation practices for nearly four years (1992-96). The terms were hard to articulate and implementation dragged on for what appeared to be eternity. Progress appeared to be based on the number of strategic planning sessions held and leadership turnover. Results were non-existent. It became evident that a fresh approach was drastically needed.

This approach came through the identification of management systems commonly shared among the 21st Support

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Group's five squadrons. These systems were derived through a systematic process that addressed compliance, internal work environments, customer-driven operational results, performance, and continuous process improvement. Ironically, this approach was adopted from the successes of the 21st Security Police Squadron's quality improvement efforts.

The results have been dynamic. The 21 Support Group's 1996 Unit Self Assessment score increased by 240 points in just one year. They also had six award-winning teams at the wing level, to include having a semi-finalist in the Rochester Institute of Technology & USA Today Quality Cup competition. Their improvement efforts can be found in Air Force Space Command's Crosstell publications as well as the *Guardian* magazine. Several agencies have benchmarked this best practice, to include the 21st Medical Group-Peterson AFB, the Directorate of Personnel, Community, and Activities-United States Army-Fort Carson, and the 721st Support Group-Cheyenne Mountain Air Station. Here is how performance-based governance can work for you.

## Compliance versus Non-Compliance

*"To be or not to be, that is the question"*  
— William Shakespeare

The fact is we are a compliance driven organization (Figure 1). In meeting compliance we are addressing the needs of our customer, the American public. The executive branch establishes public law to implement the needs and concerns of our nation. Air Force policy, guidance, and instructions ensure compliance with public law. For example, AFD 90-2, Inspector General Inspection System implements Public Law 95-452, *Inspector General Act of 1978*, October 12, 1978; Title 10, United States Code, Section 8020; and other requirements.

This compliance system is two-fold. First, this proactive system provides Air Force commanders with credible, independent assessments to measure capability of assigned forces through the Inspector Generals Inspection System, especially during Nuclear Surety and Operational Readiness Inspections. It also promotes a culture that encourages and recognizes continuous improvement through best practices in accomplishing the Air Force's mission.

Second, the Self-Inspection Program (Figure 2) process allows commanders to monitor their state of operational readiness. Each functional area is provided self-inspection guides (SIGs) through their major command directorates, which is in essence a report card of what the *customer* (public law) requires. SIGs can also help you identify your key result areas and key processes related to your organization. In most cases, they can even help you determine your customer-base and identify your mission or reason for being.

In maintaining compliance with the Self-Inspection Program and the Inspector Generals Inspection System, we are meeting *minimum* customer requirements mandated by public law. Furthermore, the results of the two systems serve as a foundation for process improvement and strategic planning. Your part is to ensure you have a proactive Self-Inspection Program. Smart management calls for making this system the foundation of operationalized quality, but in it by itself is not enough. The next step is taking care of your people.

## Assessing Internal Work Environments

*Everybody knows more than somebody, but nobody knows more than everybody*  
— Quips & Quotes

People and available resources they use are critical to mission success. Internal climate assessments (Figure 3) are management systems that can effectively gauge whether your number one resource (people) has the skills, desires, equipment, and motivation to perform the mission. The support group used an assessment developed under the direction of Lt Colonel Leray L. Leber, Director of Quality and Assessment Division, United States Air Force Academy. This 36 question assessment system effectively measures thirteen factors: Awareness of Strategic Challenge, Planning for the Future, Quality Commitment, Commitment to Progress, Subordinate Involvement, Awareness of

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Productivity & Quality Issues, Cooperation & Teamwork, Morale, Resources (Hard), Resources (Soft), Equity, Innovation and System & Structure for Quality.

Similar to the Social Actions Office assessment system, this survey paints a visual picture of what challenges lay ahead in the work centers or functional areas. When used in conjunction with the Inspector General's Inspection System, you begin to see a cause & effect relationship between compliance discrepancies and what may be contributing to them. However, these two management systems are not enough to make you Baldrige Award winners or quantify your improvement opportunities. You need an external customer feedback system as well.

## Determining Customer-Driven Operational Results

*The only reason to measure operational performance is to take action to maintain and improve good results or solve problem that cause bad results*  
— Improvement Driven Government

Most Air Force organizations have internal performance measures and some method to determine customer satisfaction; however, rarely are the two tied together. This is the first disconnect between measurement and action. The second disconnect comes in play when process owners (leaders) can't take appropriate action because such action is ultimately determined by customer expectations.

To create a link between performance measures and customer satisfaction, use the customer-supplier relationship model (Figure 4). This tool can assist you in identifying who your customers are, their requirements, what processes affect your customer-base, and who supplies the resources needed to support your processes. From here, you can develop a simple customer satisfaction and importance survey based on your customer's expectations of the services (processes) you provide. An excellent example for applying this methodology is located in the *Quality Air Force in the 21st Century; Technology & Innovation, 1996 Quality Air Force Symposium Proceedings* (page 249).

You can also develop a Customer Interview Form (categorizing Expectation, Importance, and Satisfaction). Obtain random samples by asking an open ended question like "What are your expectations for the service your receiving" and "How important was the service provided to you?" (ensure you identify a process). Then compile your data and plot your results. Considering the different responses received, you may want to prioritize and determine which ones you are willing to work on first.

Once results are obtained from the survey, they can be weighed and plotted using an "Improvement Opportunity Window" grid chart (Figure 5). By plotting the importance and satisfaction levels related to your processes, you can determine what process can be improved to enhance performance in this order (I, IV, III, then II [where you want to be]). In doing so, you have established an operational result management system based on customer requirements. At this point you are probably asking yourself 'what does this have to do with the other management systems?' Again, look for a cause-and-affect relationship.

How will a change in a compliance standard effect your process? How will it have an impact on your customers? Can you begin to predict possibilities through performance measures? How will a customer requirement affect compliance? How do you know? In what way?

It does not take a rocket scientist to figure out that leadership needs answers to the previous questions to make fact-based decisions. Now you have three management systems that can provide you that information, but how do you put them together?

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## Performance-Based Governance - Putting it Altogether

*What gets measured, gets done.*  
— Anonymous

*We spend too much time producing performance measures to send in to headquarters.  
I hope they use them, 'cause we sure don't.*  
—Government Manager

Now that you have determined a cause-and-effect relationship between compliance, internal work environment, and customer-driven operational requirements, you can effectively establish a performance-based governance management system to improve mission performance and enhance strategic planning. In performance-based governance (Figure 6), you measure more than process inputs, outputs, and efficiency. This approach assumes that it is more important to measure the outcomes or results that come from government action.

It begins with what your customers expect (outcome) and what you can provide (input). It also considers your outputs (products or service you offer) and how efficient (inputs divided by outputs) you provide the service. Note the relationship of each quadrant to the Unit Self-Assessment categories.

It is best to look at an entire management system, like the Air Force Readiness Program, when establishing performance-based governance (Figure 7). This management system or key result area is cross functionally aligned and involves elements of support, logistics, and medical groups. Each element contains performance indicators critical to mission success, like Status Of Resources & Training (SORTS), Mobility Processing Chalk Times, Immunizations, and Dental Clearances. These indicators are located in compliance directives, such as Air Force Policy Directives, Air Force Instructions, and Self-Inspection Guides.

(Not Inclusive)

In ensuring compliance, we rely on these documents to tell us *what needs to be done, and how it is to be done* (our input). These documents also serve in identifying our *mission critical products or services* (outputs) and *how to measure them* (efficiency). What remains is determining the extent to which these areas have been achieved or customer requirements have been satisfied (outcome). This is where the Inspector Generals Inspection System, internal climate assessments, and customer satisfaction surveys play a critical part in performance-based governance—they determine your strategic planning path through improvement opportunities.

To stress this point, we will use several case studies found in the 21st Support Group's five squadrons. Our first case involved the 21st Security Police Squadron's Space Systems Security Flight. The flight had just completed a review of their functional area SIGs with no discrepancies found. However, they were still receiving customer complaints from Geographically Separated Units regarding the services they provide. They applied performance-based governance and found that their customer satisfaction surveys did not address the services they provided. This may seem unfounded, but the next time you have the opportunity to fill out a survey see if there's a "link" between you (the customer) and the service (process) provided to you. Chances are there is not, but the survey will ask you if you are pleased with the service—the question here is "What part of the service (process) are you referring to?" Each part of their service was dependent upon one another and addressed in the flight's revised customer satisfaction survey. The results indicated what they thought was their best process (information flow) was their worst, based on customer expectations. Although they were in compliance with their *minimal* customer requirements found in the SIGs, their customers expected better communications. The result called for strategically planning short and long term communication upgrades to enhance their performance.

Our second case involves the 21st Services Squadron, whose leaders planned to spend 3.5 million dollars on new athletic equipment for the base gym. However, the only customer requirement was for clean towels and locker rooms—a 3 million dollar saving. How is that for maintaining compliance and meeting the needs of your customers?

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The third case also involved the 21st Service Squadron, who was planning to hire sixteen people as greens' keepers to enhance the appearance of Peterson Air Force Base golf course. Performance-based governance was applied and the need, based on customer requirements, did not exist. Strategically, the resources were used elsewhere.

A fourth case involved the 21st Mission Support Squadron, whose senior executive leadership was looking for ways to improve. They too, struggled with the quality concept until they decided to implement performance-based governance. Their approach was aggressive; establishing a formal self-inspection program, conducting an in-depth Unit Self Assessment, and conducting a three-day strategic planning session. They anticipated a six-month deployment, allowing sufficient time for work centers to develop functional plans to support improvement opportunities identified in their strategic plan. The entire effort was accomplished in 90 days.

However, the most publicized case involves the 21st Security Police Squadron's Mobility Section. This three-man work-center has changed the way Headquarters, Air Force Space Command (and quite possibly the Air Force) deploys its military working dogs (see below) and other mobility teams—thanks to performance-based governance.

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Graphic intentionally deleted to accomodate e-mail transmission

Self-Contained  
Military Working Dog  
Pallet

Graphic intentionally deleted to accomodate e-mail transmission

Standard 463L  
Military Working Dog  
Pallet

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*Performance-Based Governance  
Systematic Approach)*

Compliance  
Internal Assessments  
Customer Satisfaction  
Continuous Improvement  
Results

## Conclusion

You cannot meet the demand of every customer you serve. However, with performance-based governance you now have a systematic approach in determining; what you are *required* to do, what *processes* are involved, *how well* you're performing, and what the *customer requirements* are. It's also a decision-making tool in determining what you *can* do for your customer, based on their needs and regulatory constraints. This approach ensures *what needs to be done, gets done*. It's an easily understood and highly productive approach that most squadrons can readily deploy to enhance their overall mission performance.

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## Acknowledgement

Special thanks to Colonel Gregory A. Keethler, Commander, 21st Support Group for his support and belief in quality. He provided the leadership drive needed to make this approach possible.

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Air Force Policy Directive 90-5, *Strategic Planning*

Air Force Instruction 90-501, *Criteria for Air Force Assessments*

Air Force Instruction 90-201, *Self-Inspection Program*



**SMSgt Hector P. Lopez (Presenter)**

325th Fighter Wing, Chief, Product Improvement Program

SMSgt Hector Lopez is the Tyndall AFB Goldway Program Manager. He entered the Air Force in 1977 from his hometown, Montebello, California. He has been in the Air Force almost twenty years and has served as an inventory manager in assignments that include duty at Holloman AFB, NM; Howard AB, Panama; Hahn AB, GE; Wright-Patterson AFB, OH; and Tyndall AFB Florida. He earned a Bachelor of Science in Management/Logistics and is working toward completion of a M.S. in Management.



**TSgt Matthew R. Standish (Author)**

325th Fighter Wing, Logistics Group Quality Advisor

TSgt Matthew Standish is the 325th Logistics Group Quality Advisor. He joined the Air Force in 1980 as an Aircraft Armament Systems Specialist from his hometown, Tacoma, Washington. He began involvement in quality in 1995 as a flight quality manager. His enthusiasm for and skill with Quality Air Force raised him to Group Quality Advisor in January, 1997. He currently advises the group commander on quality issues and conducts quality training throughout the wing.



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# Gold Way: A Proactive Approach to a Reactive Situation

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## Abstract

The Product Improvement Program exists at every U. S. Air Force base. Gold Way is an office within the program whose purpose is to evaluate and initiate ideas for local repair or purchase of aircraft parts. The 325th Fighter Wing Gold Way Office carries this purpose several steps further into an aggressive, proactive team finding better ways to keep our F-15s flying. The techniques and processes they use are available for all and enable an aging weapons system to continue effective operations.

## The Reactive Situation

The F-15 is now a 25 year old aircraft. The challenge of keeping these aircraft mission capable and ready for flight is tough. This plane was not supposed to be around this long, but due to lack of money it's still here along with an important mission to maintain. In order to keep the aircraft flying, we have to find ways to repair parts that are more economical due to shrinking budgets and high fail rates. This involves establishing procedures for local repair of parts or contracting repair at costs much lower than original new price. Gold Way achieves this through aggressive research and solicitation of ideas from the people working with these parts.

## The Proactive Approach

Gold Way's approach to this situation is to actively seek out and solicit ideas which can become candidates for the initiative process. This is accomplished in several ways:

1. Articles in the base newspaper.
2. Bullets in the base Official Bulletin.
3. Pamphlets handed out at briefings provided to newcomers during regular orientation briefings.
4. Monitoring supply documents for items that show increased demand and/or a high number of back orders.
5. Inventorying Wastebuster recycle bins for items showing high usage for potential local repair.
6. Searching DRMOs (Defense Reutilization and Marketing Office) for items that can

be retrieved at no cost, repaired, and used locally or returned to Supply.

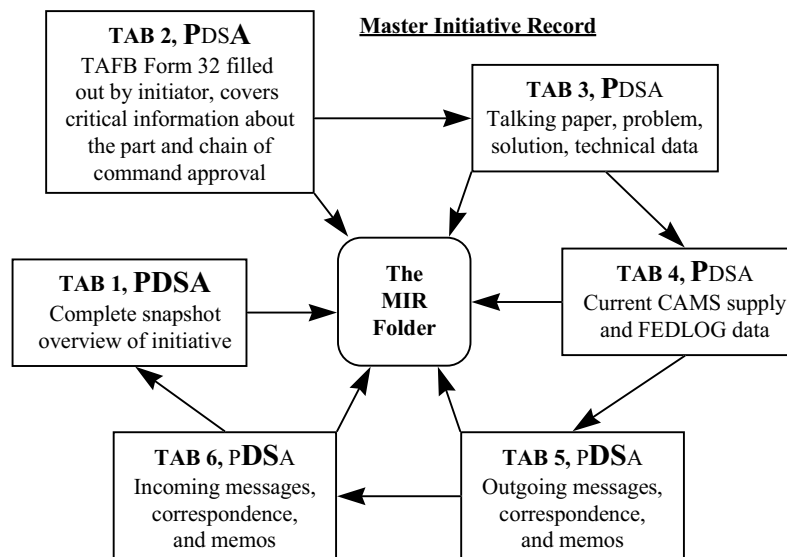
This aggressiveness gives the Gold Way Office the chance to locate potential initiatives and/or potential parts problems before they become serious hindrances to accomplishing the wing mission. Once an initiative is proposed, they use a systematic process to take action.

## The Process

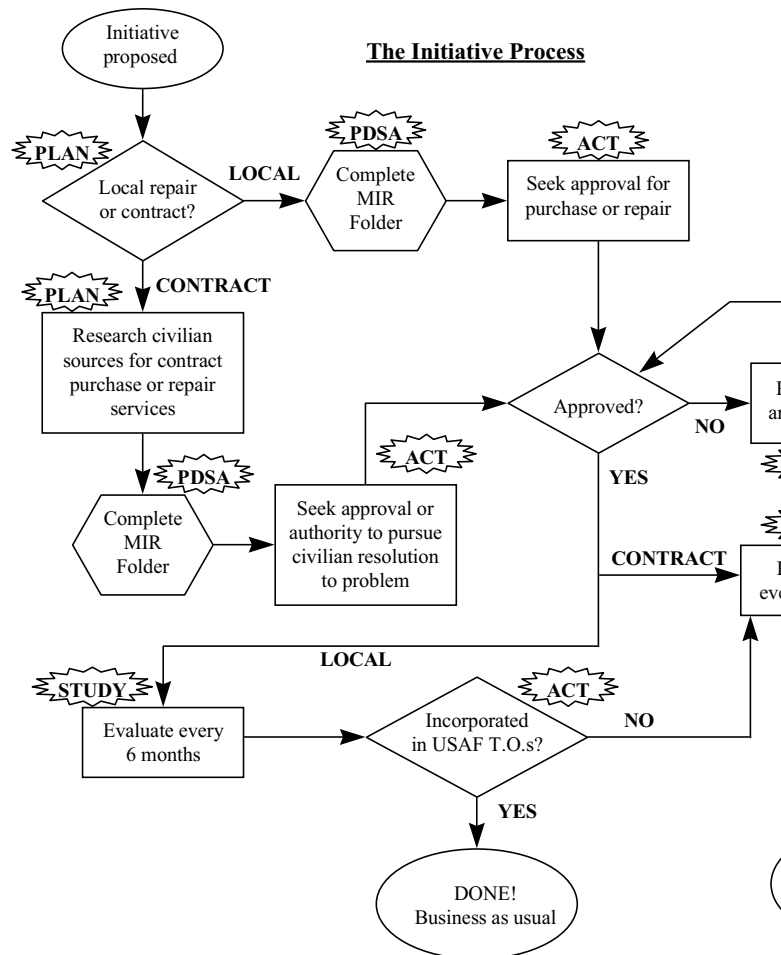
The Gold Way initiative process begins with the gathering of all pertinent information about the aircraft part. An initiator checklist ensures that essential information is collected and appropriate paperwork is completed, such as:

1. Determining the ERRC (Expendability, Recoverability, Repairability Code) and SMR (Source Maintenance Recoverability) codes.
2. Communications with ALC (Air Logistics Center) item manager.
3. Prepared and submitted AFTO Forms 22 (Technical Order Improvement Report), AFTO Forms 135 (Source Maintenance and Recoverability Code Change Request), and AF Forms 1000 (United States Air Force - Suggestion).
4. CAMS (Core Automated Maintenance System) supply data, technical order data, and FEDLOG (Federal Logistics) data.

Once all the information is gathered together, it is placed into a Master Initiative Record (MIR) folder which will contain all information pertaining to that initiative throughout its life.



Once the folder is complete, approval is sought for local repair, local purchase, or authority to pursue civilian contract resolution to the problem. Approval authority rests with the Logistics Group Commander.

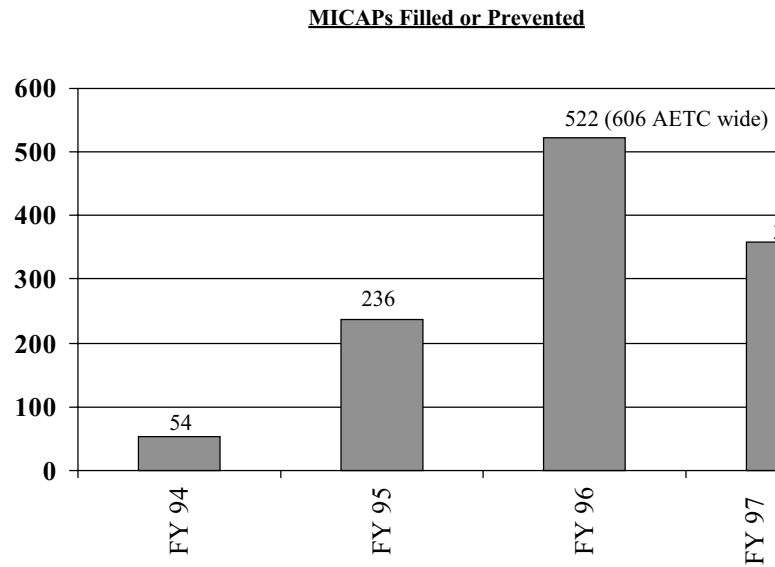


The efforts of Tyndall Air Force Base’s Gold Way Office have accomplished much to keep our F-15s in the air.

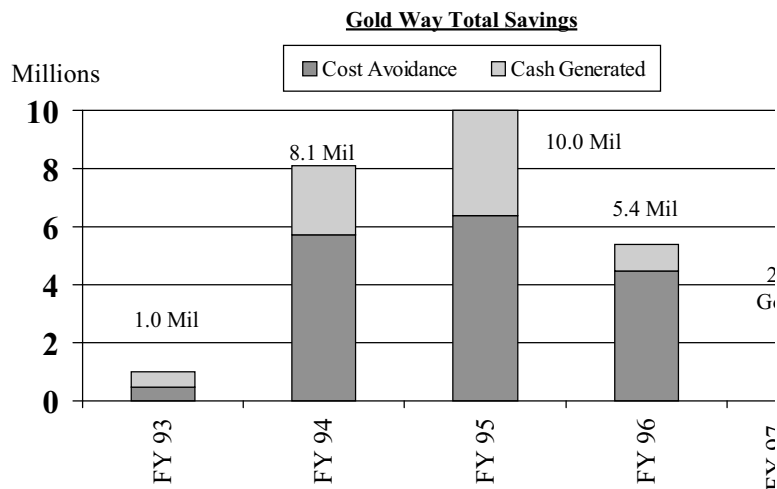
## Results

Two primary measurements are used to demonstrate the success of this office. They are:

1. MICAP (Mission Capable) conditions filled or prevented. This is a condition where an aircraft is not capable of performing its mission because of a lack of a particular part. Tyndall AFB is able to boast having solved or prevented the most number of MICAP conditions for F-15s in the Air Force. Tyndall AFB also has the lowest “cost per flying hour,” despite having the oldest aircraft in the fleet.



2. Total Savings - Cost Avoidance plus Cash Generated. Cost avoidance results when a local or contract repair is performed on a part at significantly less cost than purchasing a new part. The Gold Way office continually finds ways to acquire or repair parts for our F-15s. The savings generated are then made available to Tyndall AFB to fund other areas of the base in need. Cash is generated when parts are repaired and then turned in serviceable to supply. The difference between the item price and the repair cost is credited to Tyndall AFB.



## Success Stories

**KELLY PROJECT:** Gold Way deployed TDY to Kelly AFB to remove serviceable parts from static display F-15 aircraft 76-108 which was transferred from Portland, Oregon ANG.

**Results:**

- MICAPs: 21 MICAPs were filled at Tyndall AFB for a Cost Avoidance of \$106,364.
- CREDIT TURN-IN: 115 items were turned in to Supply for a savings of \$467,716.
- FREE ISSUE: 113 items Free Issued to users for a Cost Avoidance of \$583,355.

Total number of items recovered/reused - 249!

Total savings - \$1,152,435!

**STAB ACTUATOR SERVO VALVE:** Technicians were authorized to replace a seal under the servos, but not to replace a bad servo. Bad servos could only be replaced by depot which required purchasing an actuator at a cost of \$12,180. Acquired authorization to replace bad servos locally by Pneudraulic Shop at \$750 per pair since they were already removing them to replace the seals.

**Results:**

- 15 items repaired and free issued for a Cost Avoidance of \$171,074!
- One item turned in to Supply for a Credit of \$11,684!

**ACMI POD:** Pods were going bad because of transponder and air data sensor failure. Pods are essential for air-to-air training and aircraft are not mission capable without it. New parts cost

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\$10,000 and \$9,000 respectively and repair was not authorized. Acquired authorization to contract repair with Original Equipment Manufacturer for \$1,200 - \$2,200.

**Results:**

- Units now available for operations and less expensive.
- Aircraft are mission ready.
- Savings to Tyndall AFB, \$217,000!

### **Side Benefits**

The Tyndall AFB Gold Way Office has proven to be an agency which the entire base can benefit from. During their efforts at scouring DRMOs (Defense Reutilization Marketing Office), they keep an eye out for items Tyndall AFB can use. They find these items during visits to the DRMOs and using DRMS InterNet Queries. Some items they have retrieved at no cost include:

- Boxes of computer paper.
- Hundreds of boxes of trashbags.
- Cases of Ping Pong balls for use by Services Squadron and dorm residents.

Their efforts have saved Tyndall AFB \$33,966 in Fiscal Year 1997 so far. They have become a source for supplies to the point where units go to Gold Way first before ordering.

### **Conclusion**

Tyndall's GOLD WAY Office has become an essential element in the accomplishment of the 325th Fighter Wing mission:

#### **Train the World's Best Air Superiority Team for the Air Force**

Their efforts contribute to the wing by:

- Increasing aircraft availability for student training
  - Expanding organic repair capability
  - Out-sourcing repair of throw away parts
  - Locating serviceable/repairable parts at DRMO
- Reducing operations and maintenance costs
- Empowering personnel to solicit ideas and "play a part in the plan"

Taking an aggressive, proactive approach to keeping aircraft in the air is vital to nearly every Air Force base accomplishing its mission. With budget cuts, manpower downsizing, and aging aircraft, the need for better, faster, cheaper ways of doing business must be found. Gold Way can do it!

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### **Frank McIntire, Senior Consultant**

KPMG Peat Marwick LLP, Paper Co-presenter

Frank McIntire served as the Deputy Director, Headquarters Air Force Space Command Office of Quality Improvement and Deputy Commander, Air Force Quality Institute. He championed a systems approach, known as “Quality Air Force” or QAF, for the implementation of continuous improvement in the United States Air Force. Highlights include the development of the QAF Education and Training Architecture, development of an integrated process for strategic planning and Unit Self Assessment, development of Space Command’s first Headquarters Strategic Plan, development of a Customer Focus and Satisfaction strategy for Air Force Support Group Commanders, a system for implementing a high performance work system, and an integrated training plan designed to develop the human resource capability of employees. Mr. McIntire has served as consultant to Air Force senior leadership and leaders representing U.S. and international military organizations. As a senior consultant for KPMG Peat Marwick LLP his clients include United States Army and Air Force installations where he assists with the development of strategy and methods to achieve world-class status and GPRA compliance.

### **Mr. Chip Houlihan, Senior Product Manager**

Oracle Corporation, Paper Co-presenter

Mr. Houlihan is a Senior Product Manager in Oracle’s Applications Group where he is responsible for identifying and developing products to satisfy the State and Local Government marketplace. He is also responsible for developing a third party distribution strategy that will ensure Oracle’s success in all facets of the State and Local Government market. Prior to joining Oracle, Mr. Houlihan was the Manager of KPMG Peat Marwick LLP’s Space Systems and Technology Group’s Colorado and Front Range business practice. The focus of his business practice was on Public Sector Business Process Re-engineering; Total Quality Management; Cost Estimating, and Unit Self-Assessment. Prior to joining KPMG Peat Marwick LLP, Mr. Houlihan was responsible for Digital Equipment Corporation’s Public Sector Financial and Administrative Systems Business Practice. Mr. Houlihan spent 21 years in the US Air Force designing and implementing quality programs to improve the efficiency of personnel and administrative systems. He was twice selected as the Air Force’s Outstanding Administrator for these efforts. He possesses a BA from Texas Lutheran College and an MBA from New Hampshire College.

Mr. Houlihan has tremendous breadth and depth of experience in consulting with organizational leadership in the private and public sectors.



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# Action Planning: Linking Organizational Improvement to the Strategic Plan

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Mr. Frank McIntire, Mr. Chip Houlihan

## Abstract

Development of a Strategic Plan to provide focus and direction for military organizations is nothing new. The art of ancient warfare was developed in an arena where commanding generals marshaled resources to seize the objective and win battles (achieve goals). Efforts were coordinated through senior leaders to achieve decisive victory and support national and political strategy. More recently, earlier this decade, the development of the Harvard University model for strategic planning incorporated many of the essential elements used by organizations of all sizes in the public and private sectors. The challenge for all senior leaders is not the development of the plan but the successful execution of the strategic plan to achieve the strategy more commonly described in the vision statement (integral to most strategic plans). The vehicle that supports the successful execution of the strategic plan is the Action Plan.

## Introduction

Action Planning is one landmark methodology employed by government leadership to ensure successful achievement of objectives and accomplishment of goals in an installation Strategic Plan. As with most critical methods, Action Planning requires that certain foundational elements be in place in order to support the Action Planning efforts. The most foundational is the development of the Fort Carson Continuous Improvement Structure or CIS. The CIS governs the way the continuous improvement and reengineering efforts are planned, executed and communicated at Fort Carson. The CIS illustrates how the senior leadership at Fort Carson communicates, plans and achieves goals and objectives.

## Case Study: The Fort Carson Continuous Improvement Structure

Fort Carson has established its position of leadership within the United States Army by developing a fully integrated Strategic Plan in the previously unheard-of time of 90 days and developing a Continuous Improvement Structure (CIS), which is critical to this implementation.

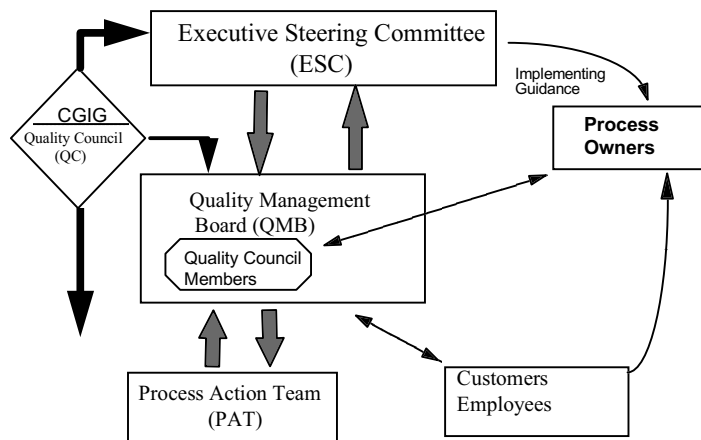


Figure 1 - CIS

Senior leadership's Executive Steering Committee (ESC) chartered the establishment of Quality Management Boards (QMBs) to drive the installation's cross-functional quality improvement and reengineering initiatives. These QMBs work along-side the traditional process owners or directorates, which drive the functional improvement. Both QMBs and directorates charter Process Action Teams to conduct research and make recommendations for improvement and reengineering opportunities. Examples to date include full-scale initiatives such as the Directorate for Resource Management's reengineering of the TDY process and DOC's Acquisition Planning Process. As the CIS provides a platform for the chartering of the seven QMBs responsible for cross- functional implementation of the plan, it also provides a platform for installation strategic planning and the development of the Fort Carson Strategic Planning Model.

#### Fort Carson Seven-Step Strategic Planning Model

Fort Carson's Strategic Plan (FCSP) provides a blueprint for the future. It is built on the foundation established by senior leadership's Continuous Improvement System. The Strategic Planning Model includes elements considered typical of those plans fashioned after the Harvard University model: shared vision, values, mission and goals and objectives. These elements were developed by the Quality Council in January 1996, and were reviewed by the ESC at an Executive Offsite in February 1996. They were fully adopted by the ESC on 17 April 1996 to establish another benchmark characteristic of the Fort Carson Model: Strategic Plans can be established in 90 days.

The FCSP is reviewed semi-annually to ensure it remains a living document that serves to chart the focus and direction of the Mountain Post (Fort Carson). The next semi- annual review took place in October 1996.

The Strategic Planning model developed by Fort Carson leadership is described in the following illustration and includes the critical step of Action Planning, the subject of this presentation.

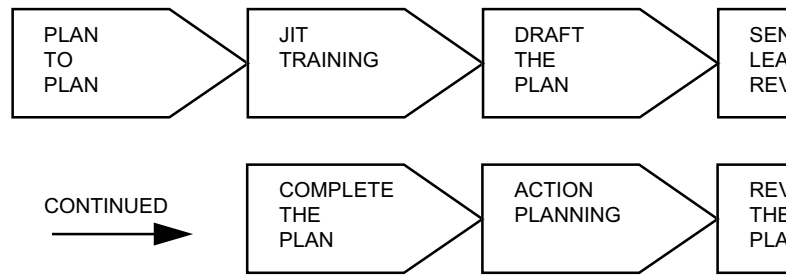


Figure 2 - Fort Carson's Seven-Step Strategic Planning Model

The FCSP describes the focus and direction for installation personnel and partners as it works toward a shared vision. Fort Carson fully expects that its competitors are developing similar strategies for improvement. It is Fort Carson's desire to maintain a leadership position and establish itself as a world-class benchmark for other installations to follow.

#### Development of Strategies and Business Plans

Senior leadership meets monthly with directorate and QMB leaders in a variety of forums to chart the short- and long-term focus for the installation. As seen in Figure 1 the ESC, QMBs, and QC links ensure top-level support for quality improvement and reengineering initiatives. Recommended strategies and reengineering initiatives are generated by functional or cross-functional PATs and forwarded in-turn to directorates or QMBs and then on to the ESC.

FORUM	FREQUENCY
· Executive Offsite	· Annually (at least)
· Strategic Plan Review	· Semi-annually
· Organizational Self Assessment ·	Annually
· ESC	· Monthly
· Quality Council	· Bi-monthly
· QMB	· Monthly (at least)
· Directorate Action Planning	· Continuous
· Directorate Offsite	· As needed

Table 1 - Strategy and Business Planning Functions

Directorates and QMBs work to implement the functional and cross-functional quality improvement initiatives and reengineering efforts chartered by the ESC. The directorates and QMBs also serve as chartering agencies for the PATs and other teams, which provide recommendations for process improvement and reengineering endeavors. The FCSP was developed using the seven-step process shown in Figure 2 (an expanded illustration with subordinate steps is seen in Figure 3).

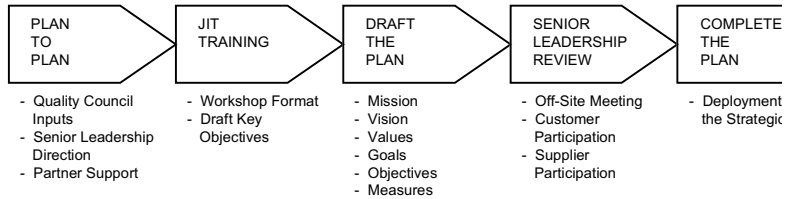


Figure 3 - Fort Carson's Seven-Step Strategic Planning Process

### Step 1 Plan to Plan

During the Plan to Plan step, senior leadership demonstrates the resolve to engage in high-level, long-range planning that takes into consideration the power projection role and also considers its full range of customer requirements and partner support.

### Step 2 Just-in-Time Training

Fort Carson's leadership (ESC) chartered the Quality Council (QC) to spear-head the development of the strategic planning document in January 1996. The QC's objective was to participate in strategic planning training (in a workshop setting or Just-in-Time to apply its knowledge) and develop a single-source document that reflects senior leadership focus and direction for the installation. The document became the focal point for the Executive Offsite in February 1996.

### Step 3 Draft the Plan

The elements of the Fort Carson SP includes:

- For governmental agencies, the mission describes why it exists and why it is provided annual funding.
- The vision, a shared perspective that describes what it is becoming as an installation.
- The values are the impetus for our collective behavior, the moral virtues by which it chooses to operate.
- Goals describe what must be achieved in order to accomplish the mission successfully.
- Objectives describe the method by which its goals and mission will be achieved.
- Measures begin with a baseline of its current performance and provide a periodic indication of improvement achieved relative to objectives, goals and mission.

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#### Step 4 Senior Leadership Review

The senior leadership accomplished a review of the installation plan drafted by the QC during the Executive Offsite in February 1996. Participants included a diverse population of commanders, leaders, managers, supervisors and family members who brought a wealth of knowledge regarding customer requirements and supplier capabilities. The outcome of the three day offsite was an FCSP document that includes all key elements required to chart the future course of Fort Carson.

#### Step 5 Complete the Plan

Following the Executive Offsite the functional areas had the opportunity to address issues related to their role in the implementation of the plan. After two meetings of the ESC, with all inputs and changes to the Plan incorporated, the FCSP was adopted in its entirety and deployed as described earlier.

#### Step 6 Action Planning

Once deployed, the functional directorates and cross-functional QMBs were provided training in action planning. The purpose of action planning is to determine the most effective method of supporting installation strategic objectives in order to achieve strategic goals and, in turn, the mission. During the action planning workshops the directorates and QMBs were instructed on their roles and responsibilities, which provided them with a greater understanding of their leadership function relative to the implementation of the SP. The directorates and QMBs identified and prioritized key processes that support installation strategic objectives, identified key customer segments, and selected candidates for process improvement and to plan future process improvements. The installation action planning method (Step 6) is illustrated in Figure 4.

#### Step 7 Review the Plan

The framework for evaluating and improving our planning process is the periodic review cycle. Installation senior leadership scheduled a six month review of the FCSP for October 1996. During this review process, leaders, managers and supervisors determine what changes to incorporate into the process of strategic planning, and what components of the plan need to be modified. The purpose for such a review is to ensure that the plan continues to serve as a living document that represents the goals and objectives of the Mountain Post.

#### Translating Strategies and Plans into Action

The integration of Fort Carson's KBDs into the FCSP is a natural outcome of the Mountain Post's alignment with the DoD move toward reinventing government, Vision 2015, Forces Command's (FORSCOM's) reengineering initiatives and the Mountain Post having the right leadership in the right place at the right time. Action planning is the vehicle:

Action Planning begins with senior leadership communicating the installation goals through a variety of media. Installation priorities are described in terms of goals and objectives which are deployed through the full spectrum of media to include live presentations by senior leadership. The Commanding General uses all opportunities to present the elements of the FCSP to installation leaders, soldiers and civilian employees. The DRM provided a briefing (on-line) for use by installation leadership in communicating the FCSP to a

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live audience. The Public Affairs Office and the DOIM communicate elements of the SP through traditional channels such as the Mountaineer and through the innovative medium of the Fort Carson home page. Goals constitute the broad performance requirements and provide a description of the level of performance required in order to achieve mission success. Senior leadership developed the strategic goals by considering:

- What Fort Carson must do to achieve its vision of the future.
- What it must do to close any gaps between its current level of mission accomplishment and desired performance levels.
- What it must do to improve its performance relative to the criteria presented in the APIC.
- What it must do to take advantage of opportunities for improvement.

Installation strategic goals describe the key performance requirements and provide a framework for measurement:

Goal 1: Leadership that guides the installation toward a new organizational and operational framework and advocates continuous improvement.

Goal 2: An installation that promotes responsible stewardship through the wise use of resources.

Goal 3: A power-projection platform for combat-ready forces.

Goal 4: A quality infrastructure that includes modernized facilities, equipment and technology.

Goal 5: A command climate that attracts, develops and retains quality people.

Goal 6: A spirit of partnership and strong relationships with sister services, surrounding communities, customers, suppliers and other stakeholders.

Once senior leadership has communicated the goals, the Action Planning begins. Directorates and QMBs identify the methods by which the goals are to be achieved: the installation key processes. The areas of performance most critical to the installation's success are described as installation key processes. The key processes are target areas that include the operational and customer driven quality requirements defined below:

1. **TRAINING:** Develop high levels of combat readiness in soldiers and develop high levels of mission support capability for civilian employees.
2. **MOBILIZATION:** Maintain the highest levels of combat readiness that will allow forces to prepare to respond quickly to national security requirements.
3. **DEPLOYMENT:** Be prepared to move combat ready forces rapidly anywhere in the world.
4. **SUSTAINMENT:** Develop the capability to satisfy mission-related requirements of our combat forces for an extended length of time, as required.
5. **ENVIRONMENTAL STEWARDSHIP:** Effectively meet regulatory and conservation requirements regarding our valuable natural resources to ensure continued access to training areas and ranges.

6. **QUALITY OF LIFE:** Ensure that the installation promotes a high level of customer focus for soldiers, civilian employees and family members.
7. **COMMUNITY PARTNERSHIP:** Be a valued and contributing neighbor in the local community, which includes the municipality and sister branches of the armed service.
8. **RESOURCE MANAGEMENT:** Achieve balanced and effective management of all resources (human, natural, financial, and time) in an environment of competing requirements.

With a focus on these key processes, QMBs and directorates accept the charter from the ESC to begin the Action Planning process. The QMBs and directorates identify those strategic goals that they support to facilitate Fort Carson's achievement of its mission and movement toward the vision state. The method by which this progress is made in the form of installation and directorate key processes is then examined. It is important to note that a specific QMB (e.g. Training QMB) has been established to drive the improvement in each cross-functional process (e.g. Training), but each directorate must also examine its own training requirements from a functional perspective.

Leaders in the QMB or directorate then create a prioritization matrix that describes the relative importance of each key process for that directorate ("y" axis, descending priority) and the customer segments served by those processes ("x" axis, no rank established).

Improvement initiatives are then described at the intersection of key process and particular customer segments. Of crucial importance here is the establishment of a complete Action Plan that incorporates all of the critical components, including identification of a Point of Contact (POC) or individual who will be accountable for the success of the improvement or reengineering effort. For accountability to be meaningful, the ESC will ensure that the POCs (and team) have received extensive training in Action Planning methods and principles. Additionally, the POC will be awarded chartering authority to establish Process Action Teams (PATs) for the purpose of conducting research and making recommendations.

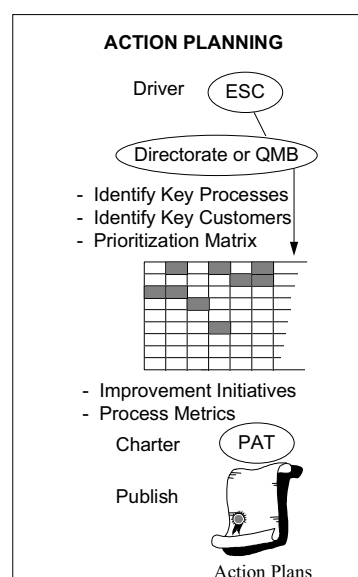


Figure 4 - Fort Carson Action Planning Model



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The next critical element is that the ESC provide a charter for the POC so the exact nature of the improvement or reengineering initiative is known by all interested parties. Next, the resources needed for the Action Plan to be meaningful and effective must be identified and secured. Normally, the identification of resources is part of the charter, although a complete test may not be available at initial charter. The final stage is the establishment of timelines and milestones. The process of communication comes full-circle as the QMB or directorate present findings and progress to the ESC during its monthly meetings or in special session.

### Conclusion

The key to Fort Carson's success with Action Planning is the foundation (CIS and Strategic Plan) on which Action Planning is based. The other key is the accountability that is assigned to the POC. The type of accountability is that of responsibility with authority: authority to acquire and use adequate resources, and authority to identify meaningful initiatives that are consistent with key processes and are supportive of the strategic goals and direction established by the ESC. The Fort Carson Action Planning Model (Figure 4) is flexible enough to respond to changes in the environment and robust enough to serve as a benchmark for organizations of any size in both the public and private sectors.

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# SIX SIGMA ...THE ROAD TO EXCELLENCE IN ALL WE DO

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## **Abstract**

In the midst of budget cuts and an increase in worldwide defense commitments, tomorrow's Air Force must reduce cost while increasing combat capability. Six Sigma allows leaders to efficiently use their limited resources to live up to the Air Force core value of "excellence in all we do." It does this by helping them to concentrate on the defects that reduce combat capability, cause rework and waste and increase the cost of doing business. Six Sigma looks at vital measures of customer, process and supplier aspects of operations to determine critical success factors and actions needed to ensure successful mission accomplishment. Six Sigma can be used to compare quality levels in similar processes. This ability helps organizations aggregate a wide variety of data while highlighting major improvements and areas requiring further attention. These comparisons allow leaders to focus efforts in critical areas for maximum impact. This tool is not a fancy sounding program, but encourages a wider application of sound process analysis techniques and process improvement methods already in use by most Air Force organizations. The concept of Six Sigma is nothing new, but its application will help us meet the needs of a 21<sup>st</sup> Century Air Force.

## **Understanding the Six Sigma Concept**

The Six Sigma concept has its basis in understanding and eliminating defects in a process. Data on defects forms the basis of a metric, or standard of measurement, used to determine the performance of that process. Fewer defects in the final product or service provided to the customer indicates higher customer satisfaction. This higher satisfaction level can be accomplished by inspecting in quality, which is costly and inefficient, or by designing in quality from the start of the process. When measured over time, we can make short-term performance predictions and establish stretch goals to drive continued improvement. When you standardize performance definitions between processes and define complexity between them, we can establish benchmarks through comparative analysis, identifying high performance processes and opportunities for improvement. We can then use established tools and techniques to drive the necessary improvements once we identify lower performing processes.

The Six Sigma concept systematically measures defects within processes, determines performance levels, benchmark best practices, and utilizes existing tools and techniques to drive process improvement towards achievement of stretch goals. This system leads towards the vision of Six Sigma; elimination of all defects within a process.

## **The History of Six Sigma**

Motorola started the movement towards excellence in manufacturing in the mid 1980s (Ficalora, 1997) when they adopted a new philosophy of zero defects. Motorola worked towards

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this by thoroughly reviewing their customers needs, analyzing their processes and the abilities of their suppliers. By doing this they were able to produce a product that was reliable and allowed them to meet the needs of the customer. The philosophy, measure, and methodology of Six Sigma form a framework that helps an organization to focus on reducing defects while improving their processes and reducing business costs.

A number of companies have since adopted the philosophy of Six Sigma. They discovered that designing and manufacturing a product without defects was not only possible, but essential to remain viable in a highly competitive marketplace. Removal of defects in any process eliminates rework and reduces cycle time thereby reducing the cost of doing business.

Texas Instruments adopted the Six Sigma methodology in 1991 (Ficalora, 1997) and discovered not only a manufacturing application, but a universal application in all their processes. They proved the Six Sigma concept was applicable anywhere you could collect and analyze customer satisfaction, process and supplier data.

With reductions in the Department of Defense budget it was essential to become more efficient and effective at producing combat power for the United States. In 1996, Air Combat Command (ACC) consulted with Motorola, General Electric and Texas Instruments on the Six Sigma concept. The Six Sigma approach demonstrated the defect reduction and increased efficiency characteristics sought by Air Combat Command. ACC personnel noted a striking similarity between the Six Sigma concept and process improvement techniques already being used within ACC and the Air Force.

## Philosophy

The Six Sigma concept aligns very well with the ideals and values of the Air Force as stated in the vision for Air Force culture. (Handy, 1995) The Air Force core value of “excellence in all we do” is at the center of the philosophy of Six Sigma. If ACC personnel allow themselves to accept anything less than their best, they are short-changing themselves and the individual to whom they are responsible...the American taxpayer.

The philosophy of Six Sigma includes six elements; 1) a common goal, 2) teamwork promotion, 3) a common language, 4) synergism, 5) comparison capability, and 6) desire for improvement. Each element is vital towards achieving the end state of “excellence in all we do.”

- **A Common Goal:** Improved process performance through defect reduction. Every process has one commonality. They all contain defects. When focusing on defects, everyone is working towards that common goal. This commonality also leads towards the Air Force desire for a common metric.
- **Teamwork Promotion:** Many operations within ACC are task-oriented; based on an individual performing just that part of the process for which they are responsible without regard for other tasks or individuals in the process. Six Sigma drives a process focus requiring individuals to team together to improve the overall process. Also, by measuring the process, supplier performance and customer satisfaction, individuals team with those customers and suppliers to identify everyone’s needs and requirements.
- **A Common Language:** Using Six Sigma as the basis for all process measures within an organization, leaders and managers can more easily understand process performance without

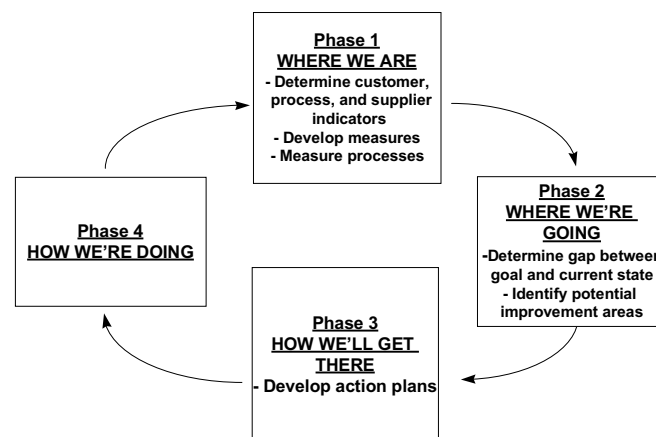
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having to interpret numerous types of charts for different processes.

- **Synergism:** Reduction of defects is not the only benefit from Six Sigma. When we reduce defects, we also reduce the cost of rework as well as the cycle time required to deliver the product to the customer. The result is a product or service that costs less, takes less time to produce, and is of higher quality.
- **Comparison Capability:** With the defect-based sigma scale providing variance for process complexity, we can compare similar processes to determine overall performance and improvement opportunities.
- **Desire for Improvement:** Current metrics are reactive in nature. When we don't meet a desired standard, we make changes to the process or metric to achieve the standard. The Six Sigma concept is proactive in nature by communicating current performance, allowing stretch goals to be established for continuous improvement.

We need a new mindset that focuses on providing a defect free, value-added product or service to the customer. The philosophy demands a cultural change from the attitudes of the past. Organizations must move away from the current attitude of accepting the standard and an acceptable defect level, to a point where they actively seek out information on defects in order to eliminate them. It is a culture change that does not allow measures to drive improvement, but replaces it with desire for improvement to be the motivating agent. They must cultivate a desire for improvement where they actively search out and eliminate system defect sources at the root cause and prevent their recurrence to save the limited resources. The new philosophy demands a change in attitude from focusing on individual tasks to focusing on the processes as a whole. We must progress from "look good" metrics to ones that enable organizations to perform better.

Gen Handy described essential elements that must be included in order to operationalize quality fundamentals in daily operations. In the Air Force end state vision for the Air Force culture. He noted that organizations must link mission accomplishment to the strategic focus at all levels. Figure 1 shows how closely the strategic planning process aligns with Six Sigma



**Figure 1**

Six Sigma drives a measure of key output areas and then uses these measures to plan for the future. In order to have meaningful goals, organizations must have a measure that gives leaders an

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accurate picture of their current process quality and capability (Where we are).

With this information, they can determine where they want to go as an organization and see exactly where the gaps exist between where they are and where they want to be (Where are we going?) This drives goals that strive for higher effectiveness and efficiency to the customer without over-tasking the process of the suppliers to produce beyond their capacity or ability. Dr. Mikel Harry, a noted expert on Six Sigma, said in his book *The Vision of Six Sigma, Tools and Methods for Breakthrough*,

“We don’t know what we don’t know  
We can’t act on what we don’t know  
We won’t know until we search  
We won’t search for what we don’t question  
We don’t question what we don’t measure  
Hence, we just don’t know”

From here organizations can make action plans that focus on reducing these gaps, (How will we get there?), then monitor progress toward reaching the established goals (How are we doing?).

Six Sigma addresses another aspect of the end state vision by encouraging team work to fix problem areas, leveraging innovative solutions and benchmarking to find the best way to provide high quality products and services for the customer with reduced cost. By including process workers in formulating process improvement strategies, we get valuable insight to how the process actually works.

Six Sigma allows focus on the areas that are important and the ability to see what the impact of defects is on the customer. Finally, it uses the same process improvement techniques that are available at all bases in the manpower and quality (MQ) office and taught since starting on the “Quality Journey”.

## Six Sigma Basics

Though the term “Six Sigma” may sound like a fancy new word, it is actually a simple concept. An integral aspect of the Six Sigma concept is the measure of the process. We define a **process** as a value-adding activity that takes resources/raw materials from a supplier and produces an output to meet the needs of the customer. The **unit** of work is normally the output of a process or process step. In order to establish meaningful measures, an organization must focus on the process and assure an understanding of the relationship between the different process elements in producing a unit. We must focus the measures on these different elements to know how each one affects the unit provided to the customer. The measure needs to be accurate and provide actionable data in order to be valuable to reduce the defects that cause customer dissatisfaction.

In order to attain desired goals, measures are required which point to improvement opportunities. In the quality journey, organizations have too often taken the “Ready-Fire!-Aim” approach to process improvement. This approach not only wastes resources but, more importantly, causes employees to see quality as a non-value-added activity that itself wastes the time and resources it is designed to save. By concentrating on eliminating defects that affect essential process factors, organizations can make improvements that will result in increased efficiency and cost reduction. Once we identify problems, we can effectively use process improvement tools and techniques to analyze the process, make the changes that improve the process and standardize the improvements to make it part of the job.

The process focus must start with a COPIS as shown in figure 2; Customer, Output, Process, Input, Supplier.

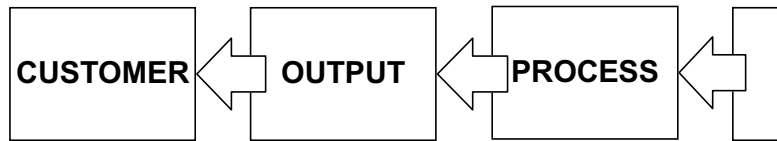


Figure 2

Organizations need to identify what they provide and for whom they provide it. They must know the critical needs of the customer, how the processes are built to meet these needs and what are required from suppliers to produce the output in the way it meets the customer needs. Once we understand **what** is being done, it is necessary to understand **how** it is done. This understanding comes from defining the process from a starting point to a point of completion. In this way we can identify both the customers and the suppliers to the process. If the organization doesn't focus on the needs of the customer, they stand the chance of mission failure not because they couldn't do it, but because they didn't know what they need to do.

Going back to the COPIS model, the same two measures in each customer, process, supplier area are vital to knowing the overall health of a process as figure 3 demonstrates. In customer satisfaction, the area of availability (Do I get it when I need it?) and reliability (Does it work as intended when I get it?) reflect the key customer requirements. Within the process, these same areas determine how well a process is working. Process measures focus on the availability (How much can I produce?) and reliability (How much confidence do I have in the process?). Supplier availability focuses on the ability of the supplier to meet my needs as far as delivery (Do I get it when I need it?) and reliability (Does it work as intended once I get it?).

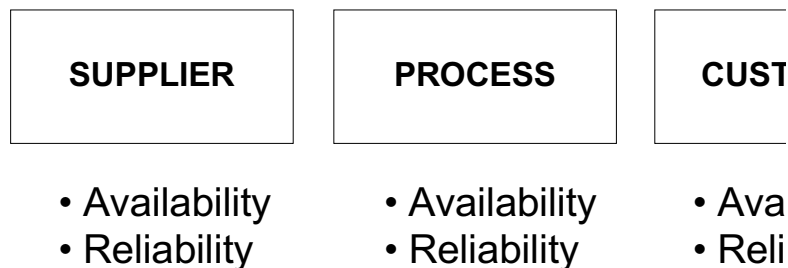


Figure 3

These six measures in availability and reliability provide a picture of the entire process and the vital elements that we must satisfy to provide an effective and efficient process.

Certain additional definitions are needed to provide information on the different aspects of the Six Sigma measure. A **defect** in the process is a mistake or error that is passed on to the customer. The places and/or steps of a process where defects can occur are known as **opportunities for error**. These opportunities for error illustrate the complexity of a process; the more complex the process, the more numerous the opportunities for error.

To illustrate how the measure works we can look at a common process example. We will look at the process of kicking a field goal in football. The process begins with the snap of the ball from center and ends when the referee blows the whistle at the end of the play. The unit is a

completed field goal attempt. The defect is a missed field goal. From a macro view, there are eleven opportunities for error when kicking a field goal. Each player has a specific job to perform during the play, resulting in an opportunity for error. We could break down each player's job into its own process with numerous opportunities for error in each. For this example, the macro view is the focus of attention.

The primary measure of performance in a process under the Six Sigma concept is defects per unit (DPU). This compares the number of defects that occur in a process with the number of units produced by that process. In the football example, assume the place kicker attempted 27 field goals and missed twice. The DPU for this example is:

$$\text{DPU} = \# \text{ of Defects Found} / \# \text{ Units Produced} = 2 / 27 = .074$$

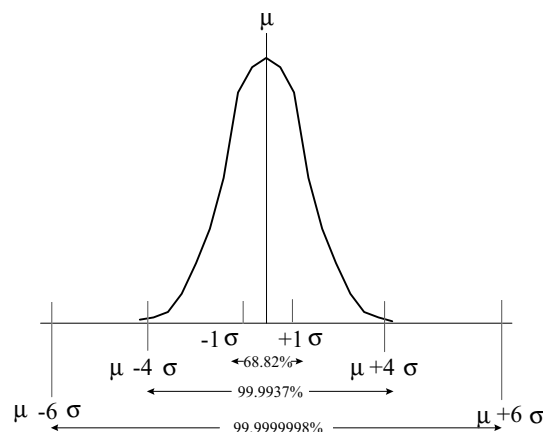
The result (.074) indicates the average number of defects found in each unit produced. With a good sample size, it could be predicted that for each field goal attempted, the probability of success would be .926 (1 - .074). DPU can be calculated for any single review point or summed for an overall operation, as in this example. DPU does not measure the severity of the defect. A defect in a car can be as small as a broken cigarette lighter or as big as a seized engine. When defining defects, ensure it is a defect that causes customer dissatisfaction.

DPU does not take into account the complexity of a process. Two processes may have the same DPU but may have vastly different complexity. This has been the reason for not comparing process quality before. Trying to compare similar processes of differing complexity was like comparing "apples to oranges." We must define Opportunities for error to account for complexity in the process to make this comparison possible. Using the opportunity for error factor in the measure changes "apples" and "oranges" into a common entity for comparison. Besides complexity, we must normalize a process measurement over a large population size to reduce the affect of variation in small sample sizes. We use one million (1,000,000) units as the standard for sigma measurement. We can determine the **defects per million opportunities (dpmo)** by multiplying the DPU by 1,000,000 and dividing the result by the opportunities for error. For the example, the calculation is:

$$\text{dpmo} = (\text{DPU} \times 1,000,000) / \text{opportunities for error} = (.074 \times 1,000,000) / 11 = 6727$$

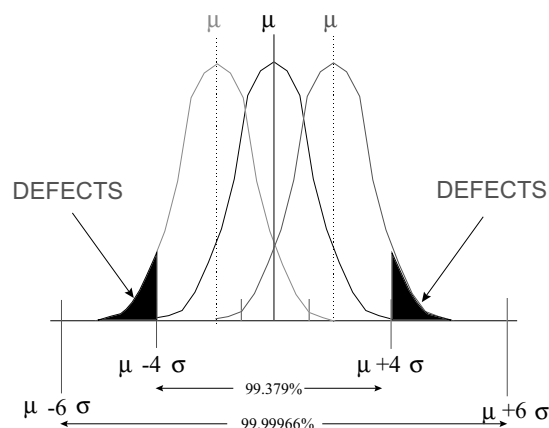
In the example, for one million opportunities for defects in field goal kicking, 6,727 defects would occur.

**Sigma** is a statistical term that measures the variability of a data set (population) about its mean (m). (Figure 4)





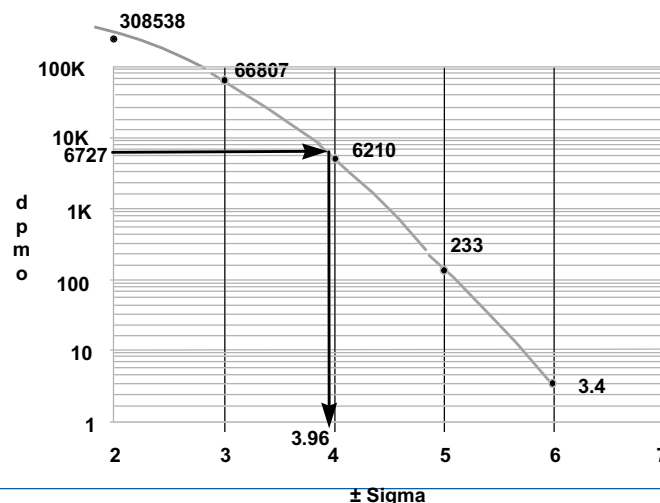
For a normally distributed bell-shaped curve, approximately 69% of the data points will fall within one standard deviation, or one sigma, of the mean; 95% within two sigma; 99.73% within three sigma; 99.9937% within four sigma; and 99.999998% within six sigma. These calculations are determined using a process that does not shift. Unfortunately, shift does occur in a process. In manufacturing, as we use a machine in a process, its accuracy changes as a result of wear and tear. The accuracy of humans who work in the process also changes. External factors like temperature, pressure to finish the job or health changes their capability to perform a consistent repetitive task. Motorola's research has shown that a process can shift by as much as 1.5 sigma from the mean over time (Harry, 1988) (Figure 5). When a process shifts, areas that were within tolerance at  $\pm 4$  sigma, now see many defects. What was 99.9937% without shift now becomes 99.37% with the shift. Even with the shift however, the process that was performing at the six sigma level still will have 99.9996% of the data points within six sigma.



**Figure 5**

With Six Sigma, defects will occur only 3.4 times in one million opportunities. For our processes, we consider six sigma to be defect-free work.

With dpmo calculated, we can determine a sigma level for the football process using a standard deviation chart (Figure 6). Calculating sigma for the field goal example results in a 3.96 sigma level.



**Figure 6**

Once we can determine a sigma level, we can compare the process to other processes for benchmarking purposes. Figure 7 shows comparative sigma levels for various processes.

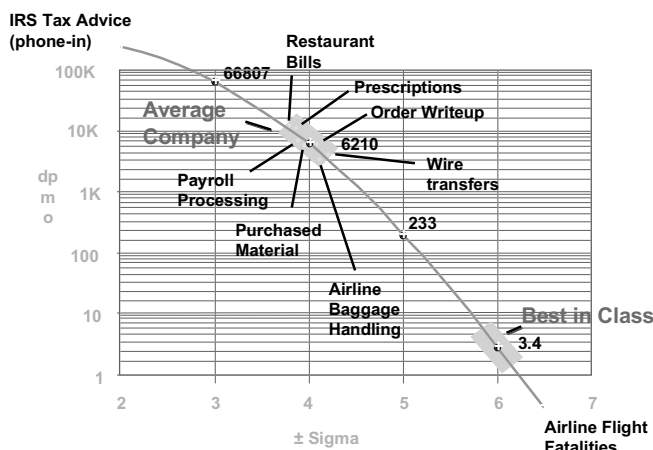


Figure 7

## Six Sigma Methodology

With all processes in an organization measured and graphed, leadership can make a comparative analysis to determine best candidates for process improvement tools and resources. Not all processes need to operate at the six sigma level. We must make every effort to move every process towards the six sigma level, but the resources or technology necessary for such achievement may not be available. As in the airline industry, passenger safety is worth the effort of achieving and maintaining a six sigma level or higher. Baggage handling, however, may not appreciably increase customer satisfaction by spending the money to make it perform at the six sigma level.

The methodology of Six Sigma is the final element that pulls everything together. The four steps of the methodology approach allow us to examine, analyze, improve and standardize the process.

The four steps to Six Sigma are:

1. **Maintain a COPIS Focus.**
2. **Measure and Analyze the Process**
3. **Take Action to Improve the Process**
4. **Standardize the Process Improvement**

The first step again looks at the COPIS, but this time in a more micro view. This view shows a detailed breakdown of the process and the individual steps of the process. A flowchart showing the steps of the process is produced to identify where defects are introduced. Second, with defects

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defined, we develop process metrics to measure process performance. Through analysis and comparison of metrics, we can make objective decisions for allocation of resources for continuous process improvement. Third, once we determine an improvement opportunity and establish a desired improvement goal, organizations can apply standard process improvement techniques like Action Workout or the 7-step continuous improvement process to achieve the goal. These process improvement techniques should concentrate on “goof-proofing” the process by eliminating defect-causing steps where possible, changing procedures to simplify the process or providing more reliable equipment to make it more efficient and defect free. The fourth step in the methodology is the most critical. Failure to standardize improvements made in a process through rewriting policy, changing technical data, or training material, dooms the improvement to revert back to its former state. This regression will cause a rapid return to the former, defect-producing, less efficient state and will frustrate process workers and waste valuable resources.

### Summary

The process analysis tools used by industry provide a direction towards reaching the goal of excellence. The road to that goal lies in the elimination of defects; not through fancy sounding programs, but through the application of sound process analysis techniques and process improvement methods already in use by Air Force organizations. The concept of Six Sigma provides the process analysis system to identify the defects in processes. Once we objectively identify the defects, we can use the tools and techniques already in existence to eliminate these defects. The application of quality principles within key processes is the only course that will produce the kind of efficiency and effectiveness required to meet the needs of an Air Force in the 21st century.

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### **Maj. Michael J. Muellner**

Major Muellner is the Chief, Imagery Production and Mission Systems Branch, USSTRATCOM, Offutt Air Force Base, Nebraska. A digital technology trailblazer, he established both TAC's and USSTRATCOM's digital target material programs. He also initiated DoD Basic Target Graphic (BTG) production and his branch created over 40 percent of wartime BTG's for DESERT STORM. An early disciple of TQM principals, his current production and customer service program are under consideration for a 1997 Government Technology Leadership Award.

### **Master Sgt. Robert M. Johnson**

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# PATH TO DIGITAL PRODUCTION—AN AVENUE TO SAVE MONEY WHILE ENHANCING CUSTOMER SATISFACTION

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**Maj. Michael J. Muellner, Master Sgt. Robert M. Johnson**

*United States Strategic Command*

## ABSTRACT

USSTRATCOM's Imagery Production Branch was a traditional "wet" production lab at a crossroads driven by changing technology and the need to meet ever-faster production cycles. There was only one avenue to success—completely embracing the pathway to digital production and transitioning from an historical laggard in the field to a leader. Driven by the Defense Intelligence Agency (DIA) to achieve 65 percent digital production by the year 2000, the branch embarked on a journey of modernization. As their program unfolded, they exceeded DIA's digital production goal, saved thousands of production dollars, put combat tools in warfighters' hands faster than ever and reached near-perfect scores in customer satisfaction. These milestones were reached through a combination of leading-edge technology, the continuous process improvement (CIP) model, and an old-fashioned commitment to quality.

## BACKGROUND

**Introduction:** The Imagery Production Branch has a proud history of providing the best service available in film processing and printing. During their "glory years" as a member of the 544<sup>th</sup> Strategic Intelligence Wing, they were a jewel in the crown of the Strategic Air Command (SAC). As such, they participated in the national reconnaissance mission with a squadron of 350 people and operated a 40,000 square foot imagery lab. All of this began to change with the fall of the Soviet Union, the decline of the DoD budget and the explosion of digital production methods.

These changes hit the Imagery Production Branch hard. It lost its role as a member in the day-to-day national reconnaissance mission and saw its manpower dwindle from a squadron of 350 to a branch of 65—with another round of cuts threatening an additional 50 percent reduction. In response, the branch began building a foundation for a methodical transition from the traditional chemical-based production methods to a digital environment. This environment would streamline production and eliminate the reliance on hazardous chemicals which were becoming more of a regulatory nightmare each year.

At this juncture, there was an opportunity to speed the transition process and embrace the best production methods emerging from the digital world. The branch restructured as quickly as possible into a digital production center capable of direct support to warfighters world-wide. Direct support was achieved through digital transmission of target materials and other tailored imagery products needed for contingency planning.

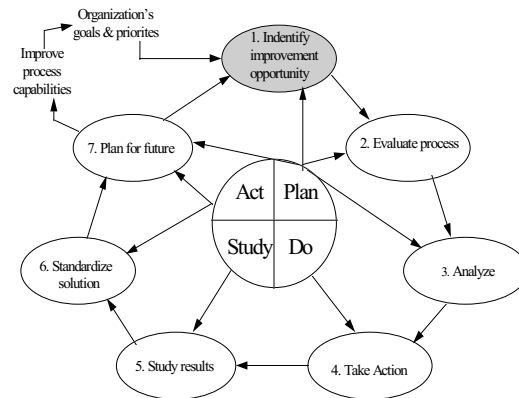


Figure 1

While entering this new territory of digital tools supporting mission planning, the process was also improved by concurrently building upon the branch's legacy of customer service and satisfaction developed during decades of support to SAC and the national intelligence community. The engine driving this digital evolution and renewed focus on customer satisfaction was the implementation of Total Quality Management (TQM) principles and the Quality Air Force CIP model. The requirement to create a world-class digital production center was identified as the improvement opportunity, step one in the CIP model (see Figure 1).

**TQM Principles and Methods:** The foundation of TQM is education and this was the first principle adopted. The goal at this point was to reach an awareness of what a robust TQM program could offer to the three sections in the branch. This was achieved through a commitment to TQM training and education that spanned all ranks. Given the unusual rank structure and diverse functions (see Figure 2) expected of the 65-person branch (1 officer/ 59 enlisted/ 5 civilians), the decision was made early to minimize the influence of rank in the TQM program. Many of the primary drivers of the program were E4s and E5s. With this cadre, the branch began an earnest effort to expose as many members as possible to TQM principles. In all, over 20 percent of the branch received initial, follow-up and specialized training. In addition, TQM was discussed at each monthly Branch Call. To insure an even "pollination" of TQM ideas throughout the branch, personnel were selected for training from all four production elements in the Imagery Production Section as well as subordinate elements in the Maintenance and Supply Sections. This widely dispersed exposure insured across-the-board adoption of TQM principles throughout the branch and enhanced the creation of a branch-wide "culture of quality". Everyone was speaking the same language and many of these people were selected as part of the branch's first Quality Counsel to conduct training for others and recommend quality improvements.

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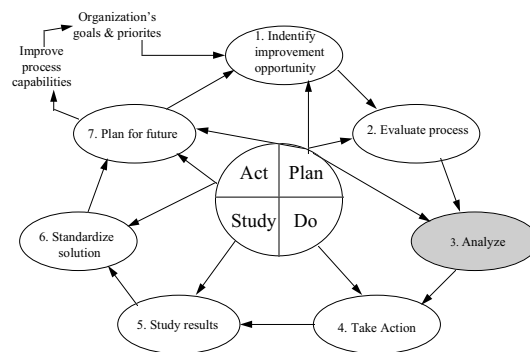


Figure 4

The third step in the CIP model is to analyze the opportunity (see Figure 4). The process of Thoughtful Acquisition achieved this goal and resulted in the judicious use of increasingly tight budget dollars while making the most positive impact possible on production. This impact was judged in three ways. First and foremost, it had to improve the speed of producing combat tools and the method of getting them into the hands of our war-fighting customers. In other words, finished target materials had to be produced faster than ever and then electronically transferred to mission planners and warfighters. This concept insured the Imagery Production Branch was in step with DIA's emerging digital production and connectivity program known as the Joint Intelligence Virtual Architecture (JIVA). Second, the acquisition plan had to make fiscal sense. It had to provide such significant cost savings that it immediately demonstrated the value of pursuing this modernization program. Finally, the process had to fit the “do more with less” reality the Air Force was facing as we approached a new century. The production environment had to be successful even operating with reduced manning levels. All of these factors were analyzed and combined into a grand strategy designed to speed the transformation process. The strategy was called LAB 2000.

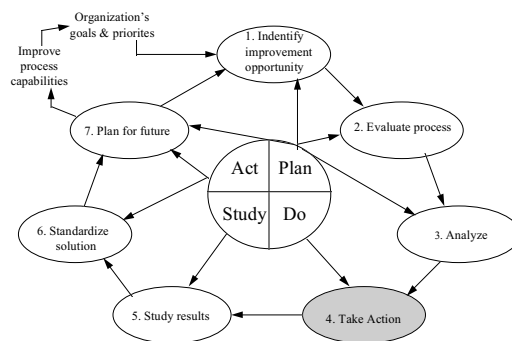


Figure 5

**The First Digital Production Line:** The fourth step is to take action (see Figure 5). Based on customer analysis, production volume, impact achieved per acquisition dollar spent and projected improvements to production efficiency, the first product selected for conversion to digital production under the LAB 2000 program was the Aim Point Graphic (APG). This targeting product, used to put precision-guided munitions (PGMs) on target and update the internal navigation

system of fighters, bombers and tankers, was the ideal candidate. APGs are produced in high volume, 19,696 were created in 1995 alone, and the action plan revealed that there was a significant per-unit cost savings to be realized.

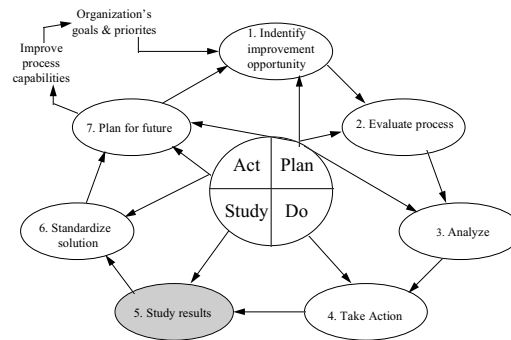


Figure 6

Study results is the next step in the CIP model, and the results were amazing (see Figure 6). The traditional, “wet” method of production resulted in a cost of about \$1.42 per APG. Digital production slashed the unit cost to only 19 cents each. Combining this 87 percent reduction in the cost of production with the massive volume of APGs produced, resulted in major savings. In 1995, 19,696 APGs were produced at a savings of over \$24,000. The next year, APG production increased by over 75 percent to 34,561 APGs, and resulted in an additional \$42,500 in production savings. As great as these dollar savings were, savings in delivery time were equally dramatic. Because close adherence to JIVA tenets were always followed, instant transfer of finished products was possible during the production surge supporting Operation DELIBERATE FORCE. During this contingency, CONUS-based bombers deploying to the Bosnian theater had an urgent need for several dozen APGs with which to conduct a PGM bombing campaign. In response, a production surge was initiated. A targeteer at the Joint Analysis Center in England called USSTRATCOM and requested the products. The APGs were digitally produced in Omaha and then electronically transferred to the theater—within 30 hours of the request. Once there, the APGs were put on a local area imagery network that made these products available to mission planners throughout the theater. This production surge, saving days in production and distribution time, was one of JIVA’s first major success stories.

**Launching the Customer Quality Program:** From its beginning, we knew that LAB 2000’s remarkable success in achieving digital production goals needed to be grounded in sound TQM principles. Although cost savings of production and speed of distribution are praiseworthy goals, these production milestones still needed to be studied to determine if they met the customer quality characteristics. The same TQM principles driving the initial focus of this production renaissance were also brought to bear on an effort to renew the branch’s quality commitment to their customers. The branch goal was to establish and measure world-class levels of customer satisfaction. To study the results of customer satisfaction, a vigorous customer contact program and survey analysis was initiated (see Figure 7).

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## Monthly Trend Analysis and Customer Contact Rate

(Figure 7)

The customer contact program was based on a minimum contact rate of 30 percent of each month's customers. The top line in Figure 7 shows, the level of work orders from month to month. This changing level of work order tasking drives an ever-changing customer contact goal based on each month's work orders (bottom solid line). As witnessed on the graph, the actual contact rate was always at or above the contact goal of 30 percent. In fact, the aggregate contact rate since the program's inception in July of 1996 is 36 percent—about 575 contacts since this program started.

**Customer Satisfaction Rate:** The customer contact program revealed that the branch's legacy of commitment to its warfighting customers could be accurately measured and recorded for the first time ever. The data developed via the customer contact program was used to compile a Customer Satisfaction Index (see Figure 8). The results of the data collection and index show customer satisfaction has been at or near 100 percent since program inception. It is also testimony that LAB 2000 has smoothly transitioned from the concept stage to a sound institutionalized production program, with major production savings and no degradation in customer service or satisfaction.

## Customer Satisfaction Rate

(Figure 8)

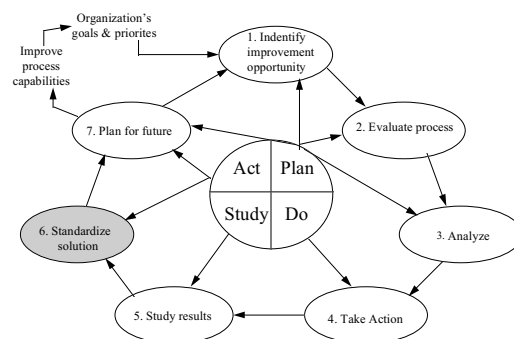


Figure 9

**Digital Production Expansion:** As the branch's success in producing APGs became routine, the next step was to standardize the solution, which is the sixth step in the CIP model (see Figure 9). Additional products were evaluated for conversion to digital production (see Figure 10) and through this evaluation process, a wide variety of tailored products were included under the digital umbrella. These products supported dozens of customers throughout the DoD—everyone from USSTRATCOM nuclear and conventional targeteers to Infantry Division combat units.

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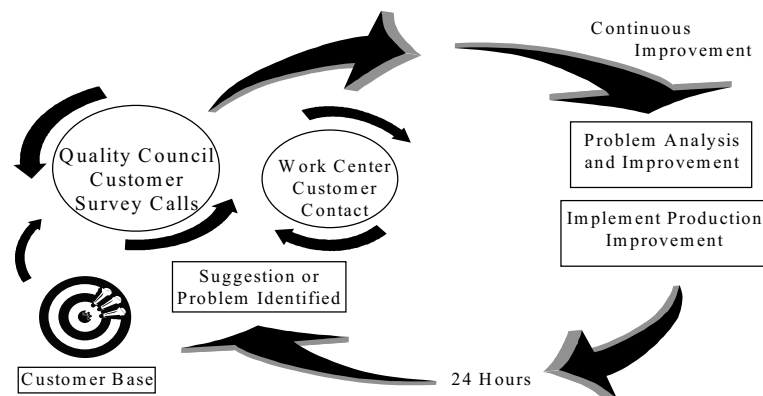
## Digital Environment Evolution Plan

(Figure 10)

This standardized solution and evaluation process resulted in a total of 44,339 annotated prints being produced digitally during 1995 and 1996. This huge shift to digital annotated print production resulted in over \$54,500 in processing savings. This savings was in addition to the \$66,500 saved by digital APG production during the same time period. In total, over \$121,000 in production costs were saved during 1995-1996. This was almost than the cost of the digital equipment's procurement. Truly, this expanding digital environment was not only meeting warfighter needs worldwide, it was earning the bookkeeper's respect.

**Continuous Cycle of Improvement:** In standardizing the solution of tracking customer satisfaction, we developed a means to identify, handle, and review process problems. This information from the customer contact program was also used to foster a cycle of feedback and continuous improvement within the Imagery Production Branch (see Figure 11). The model we developed allows for rapid response and resolution of customer concerns and problems.

### Customer Satisfaction Improvement Cycle



(Figure 11)

When a customer contact reveals a problem, the Branch Quality Team has allotted themselves 24 hours to resolve the problem to the customer's satisfaction and initiate a process review. The process review evaluates the production process to determine what caused the problem and how that problem can be avoided in the future. In one case, a customer complained about the quality of the imagery they received. The process review revealed a bad sensor in an enlarger that was causing partial blurring of the product. The Maintenance Section replaced the bad part and re-calibrated the equipment to restore production. The branch's dedication to quickly resolving customer problems and using this feedback to improve the production process has resulted in greater rapport with the branch's customers and a sense of "partnership" in the process.

The feedback data is also used to foster a general culture of quality in the branch and an appreciation for the results TQM provides. Each month the branch holds an “all hands call” and the monthly customer contact results are reviewed as part of the program. In addition to the graphs previously shown, any problems that were identified and fixed are discussed. The branch also reads some of the positive comments and “pats on the back” received that month. This part of the program insures the information gets down where “the rubber meets the road” and acts as a morale builder for the whole team.

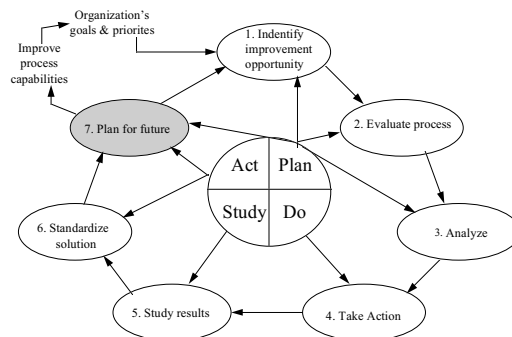


Figure 12

**The Conclusion - but not the end:** In mid-1995, USSTRATCOM’s Imagery Production Branch found itself at a crossroads - challenged by technology on one hand and the military draw down on the other. Instead of staying on the well-worn, traditional path of production, they used these twin challenges as an opportunity to grab the fast lane on the information highway. As a result, they saved over \$121,000 in production costs in two years, proved the JIVA concept by electronically putting target materials into warfighters’ hands half-way around the world and earned top marks from a customer base spanning the DoD. In addition, they eliminated the need for thousands of gallons of processing chemicals and the environmental problems that go with them. The last step in the CIP process model is to plan for the future (see Figure 12) and as we develop that plan, we evaluate the organization’s goals and priorities to identify new improvement opportunities and start the seven-step CIP model again. The future holds new rewards and milestones as we enter Phase II of LAB 2000, integrate new products and systems into the digital pipeline and continue to build and improve the seamless digital web supporting warfighters into the next century.

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### **Maj. Stephen A. Newlon**

In December 1995, the Air Mobility Command participated in a Kaizen event (Action Workout) to learn about lean production. Since then, Maj. Newlon, Command Quality and Management Consultant, has conducted Action Workouts throughout the command. He has led teams to bring about radical changes resulting in significant waste reductions and tremendous savings.



Gen. Walter Kross, AMC Commander, was so impressed with the results that he directed Maj. Newlon to train other facilitators and begin a command-wide attack on waste.

Maj. Newlon is a graduate of Boston University (CM, Ed.). He is married to the former Dilek Tiglioglu and has four children, Jennifer, Sarah, Stacy, and Angela.

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# Shaping Tomorrow's Air Force Through Lean Production

## *Beyond Action Workout*

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**Maj. Stephen A. Newlon**  
*HQ AMC/XPQC, Scott AFB, IL*

### ABSTRACT

The following dissertation addresses the Air Force's need to incorporate lean production to reshape its future. This need comes from work force reductions, increased operations, and Outsourcing and Privatization competition. The essay also explains that Action Workout (AWO) is one tool for implementing lean production, but focusing on daily implementation as well will bring greater results. The AF is using AWO for process improvement, rather than creating an entire efficient and effective organization. The paper discusses the meaning of lean production, and its seven primary major concepts. It also covers what the AF can do to implement these concepts. Training is also addressed. This paper explains that lean production will be successful in the AF because the concepts are simple to apply and delivers results. Lean production focuses on doing rather than on a complicated theory. Lean production is the weapon of choice for major corporations, such as Boeing, General Electric, Allied Signal, and Pratt-Witney. The AF needs the powerful, simple, and effective concepts of lean production to shape today's AF to meet the ever-increasing challenges of today's world.

## Shaping Tomorrow's Air Force Through Lean Production

### *Beyond Action Workout*

Imagine the most efficient and profitable company in the world today offering to share its secret of success with the Air Force (AF). This would certainly generate excitement. Along with the excitement would also come some of the usual skepticism. Let's imagine that, along with sharing the secret, the company promised that the ideas were simple to understand and apply. This would definitely sweeten the pot. Great news! There's no need to torture yourself with imagining, because all this is available. The secret? Lean production. Lean production holds the potential for helping the AF meet the many challenges that it faces. It provides commanders and supervisors the necessary tools for making their organizations more efficient and effective.

Lean production originated in Japan where they faced a shortage of work force and cash after WWII. American workers were producing 10 times more than their Japanese counterparts. An industrial engineer, Taiichi Ohno, couldn't believe that Americans were working that much harder. He surmised that the Americans were working smarter. Ohno toured western manufacturing plants collecting ideas. He discovered scientific management at the Ford plant. He also observed that the massive machinery that forced batch production wouldn't work in Japan due to the shortage of cash. Ohno returned to Japan and developed the Toyota Production System (TPS), also known as lean production. The TPS is the dominant production system in the world today, and Toyota has \$68 billion in the bank to prove it.



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In 1953, Japan had 2% of the automobile market. Today the small, powerhouse country has over 28% of the market. For the past 20-30 years Japan has used lean production. Ford, Boeing, and Allied Signal now use lean production. Pratt-Witney and GE, who face off daily in tough competition in the world market place use lean production to improve. Many companies don't even openly discuss their application of lean production for fear that their competition will learn of the approach! The AF has a need and an opportunity to apply lean production. We must not lose it; the stakes are too high.

The focus of lean production is captured in one word, "waste", or in Japanese, "*muda*." An estimate is that 90% of all processes is waste. In some cases managers have measured their processes and found only 0.9% to be value-added. This 90% waste is the focus of attack when applying lean production. Ohno put waste into seven categories: 1) Overproduction; 2) Motion; 3) Excess Inventory; 4) Que/Wait time; 5) Transportation; 6) Rework; and 7) Redundant Processing. Processes in the AF are no different. They are 90% waste as well. This isn't a problem, it's an opportunity. . . a solution for reducing cost and increasing efficiency. These seven wastes are the "enemy" in lean production and there are amazing results when teams are trained on the types of waste. It begins to open their eyes as they view their work with a new set of lens. They can now see value-added work and non-value added work.

The AF has started to attack waste through Action Workouts (AWO). These are one-week long events where teams attack waste. The focus of AWOs is on doing, and teams deliver results, not just recommendations, to commanders. The results of the AWOs are outstanding. Teams typically reduce cycle time by 50% or greater, and achieve other significant reductions in waste. Both the Air Combat Command and the Air Mobility Command regularly conduct AWOs, and other commands are beginning to adopt them.

AWOs in civilian industries are known as "kaizen events." Kaizen is Japanese for continuous improvement. In lean production it usually means the same thing as an AWO. Many companies that implement lean production don't do so only with AWO events. They use a more systematic approach where an entire plant will focus on lean production. This transforms the organizational culture rather than just improve a process. If AWOs are used, it's a systematic approach to applying lean production where one plant (squadron) will have many events a year. A company with 300 people will usually have at least one kaizen (AWO) event a month. The AF is using AWO as a 911 call for help. A base or unit may have one event and then attention is focused elsewhere. The AF will enjoy even greater benefits as it develops a broader application to lean production that transforms the culture. The AF needs to establish a system of applying lean production that is more similar to a health and fitness plan rather than a call for the ambulance.

The power of AWO comes from the implementation of the lean production concepts. This is an important point. People often ask, "What's the difference between AWO and Process Action Teams?" The answer is the lean production concepts. There are seven major concepts that apply to the AF:

a. **The Five S's:** Comes from five Japanese words that mean Organization, Orderliness, Clean-ness, Standardized Clean Up, and Discipline. The 5 S's are the foundation of all process improvement activities.

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b. **Visual Controls:** The techniques of providing information and instruction about the elements of a job in a clearly visible manner so that the workers can maximize their productivity. They are signs that help control production similar to road signs control the flow of traffic.

c. **Process Layout:** The arranging of equipment according to sequence of process and eliminating conveyance waste.

d. **One-Piece Flow:** When a process or information moves from one operation to the next, one piece at a time.

e. **Pull Production:** When downstream processes control production of upstream processes.

f. **Production Leveling:** Scheduling a steady flow for better control.

g. **Standardization:** The hidden jewel for producing high quality with low cost and fast delivery. It involves clear, simple descriptions of the best methods for doing things.

There are two important qualities of the lean production concepts. First they are simple to understand and this aids in their deployment. This isn't to confuse them with "simplistic" which means not aligned with reality. Most teams can be taught the concepts in a half day session. The other quality of the concepts is their affect. They bring existing, hidden problems to the surface where they can (have to be) worked. With out this knowledge, organizations could implement lean production and think the concepts were causing the problems rather than surfacing them. The alternative to facing these problems is continued waste leading to increased cost, lack of efficiency leading to poor mission support.

The first change for the adaptation of lean production concepts must be in the mind. The AF must change the way it looks at processes as a critical first step in applying lean production concepts. It must shift from we "process" to we produce or manufacture. As James Womack stated in his book, *Lean Thinking*.

**"Customers don't buy processes, they buy products. Organizations must focus on the products; on creating value for the customer."**

Examples of this paradigm shift are: We don't process boxes . . . we manufacture air cargo pallets. We don't process information . . . we manufacture Schedule of Events. We don't process mail . . . we manufacture sorted tubs of mail. The identification of the product often isn't easy, but it's necessary. This paradigm shift is a critical first step with many rewards. Focusing on the tangible product rather than the process gives people a feeling of accomplishment and opens doors to applying lean production. A video entitled, *Time: The Next Dimension of Quality* is an excellent tool for helping people make this shift. The lesson on the video explains how to view the process through the "eyes of the product." This shifts focus from **people** who may be busy, but are adding no value to the customer. The video explains that it's not that people are bad, but that we are often operating under systems that were once necessary, but now need changing. A focus on the product also starts people looking at the "flow" of their product which is key to the lean production concepts.

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The question is, “If the AF is using AWOs, and getting results, what’s missing?” It’s the daily application of the lean production concepts. The AF needs to focus the concepts across an entire organization. For example, an organization may be an Aerial Port Squadron or a Supply Squadron. If all processes have 90% waste, then 90% of what an organization does is waste! We must address it all. Processes are interrelated. We must look at the whole organization as well to study the system(s) and focus AWO on the problem areas, the bottlenecks.

Applying Lean Production throughout the entire organization means involving everyone, attacking waste daily, and in all processes. The lean production concepts provide commanders with tools for meeting the heavy challenges they face (mandatory personnel reductions and increased workloads). The attack on waste provides a sense of direction. Lean production increases morale as seen at the Freemont, California GM-Toyota plant where employee satisfaction went from 65% to 90% in just two years while productivity doubled! Lean production involves basing production on customer’s demands, increasing quality and responsiveness, which means **greater customer satisfaction**.

It’s important to clarify the relationship between daily implementation of lean production and AWO. AWO is a tool to help implement lean production. The two aren’t separate programs. AWO should be used to achieve breakthroughs and make changes supporting the organization’s objectives. Daily implementation of lean production helps secure the changes achieved in AWO. The focus of daily implementation is changing the culture where everyone automatically eliminates waste. AWO focuses on breakthroughs, facilitating change, and taking large chunks of waste out of the organization.

The question remains then of how to introduce the lean production concepts to the AF and achieve a much broader application than AWO alone provides? Col John Warden, Air Command and Staff College, provides an outlook for war that is adaptable to implementing lean production in the Air Force. Col Warden suggests looking at the enemy as a system with 5 concentric rings. The leadership and system essentials should be the targets to attack. The further one gets from the center, the less impact there is on the system. Establishing a lean production system without the inner rings is the equivalent to having had an enemy destroy them. The 5 concentric rings model provides a simple and effective way of keeping the focus on the right areas. In past initiatives, the AF trained quality advisors and people with little executive training. The result was frustration. Quality Advisors not able to fully implement quality initiatives and people not able to make improvements to their full extent. The 5 rings model will aid in looking at the lean production as a system. It will aid in putting attention in the right areas, and aid in preventing repeat mistakes. These rings applied to lean production include in the innermost circle “leadership.” This is followed with system essentials, infrastructure, people, and the outermost ring is facilitators. A look at each of these provides insight to a systems approach to lean production.

“Leadership” is the innermost ring and is the “center of gravity.” This means if it falls out, the entire system caves in. In other words, failure! In lean production, leaders must understand the concepts and commit to implementing, them. Leaders establish objectives, such as a 50% increase in productivity. Leaders need to be actively involved and participate in at least one AWO per year. Leaders must communicate their objective with lean production so subordinate leaders and workers clearly understand. Leaders must ensure they include communication with applicable unions. This

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needs to include candid discussion. In lean production, leaders need to understand the 7 wastes and be able to spot inefficiency. Taiichi Ohno would take plant managers onto the floor, draw a circle around them and make them stay until they gained “awareness.” Lean Production advocates leaders who get their hands dirty . . . who visit the shop floor. These visits are to help solve problems, and spot waste and help eliminate it. The shop floor is where the truth is. The truth isn’t in an office or conference room. Leaders are the most critical component to a successful lean production system.

“System essentials” is the next ring out. The word “essentials” itself implies those critical few items that must exist for the system to succeed. In lean productions they are the concepts, results, money, and training. The concepts as discussed earlier are the 5S’s, Visual Controls, Pull Production, etc. These concepts are the tools for significant improvements and waste elimination. Without these, results in lean production and with AWO will quickly lessen. The results of AWO has been the catalyst for leadership interest and support. There must continue to be a delivery of results. Without them, the inner ring of leadership, will quickly fade away. Training is also critical for the education of senior leaders, teams, facilitators and people. Training may need to extend to vendors/suppliers so they can develop the needed sensitivity to the issues the organization is facing as it implements lean production. Toyota often assists its suppliers with implementation of lean production. This increases supplier quality and helps suppliers meet just-in-time delivery requirements. A lean production system will need money for training, equipment, and supplies.

“Infrastructure” usually means roads, grounds, electric plants, and communication lines. In a lean production system, infrastructure is the communication process for organizations to share best practices. It’s the working together of facilitators to achieve objectives. It’s the lesson plans and other training aids that “produce” the energy of trained and motivated people. Infrastructure is the partnerships with other industries that is so critical to the system’s growth. A recognition and reward system is another important part of the infrastructure. This could include incentive for continuous improvement and ongoing lean production implementation. These incentives need to be tied to the objective established by the commander.

Following infrastructure, the next ring out is “people.” People need to view lean production as a commitment to them. They need to view it as an opportunity, not as a threat. People need to believe the concepts and see them as a way to make their work easier. As the AF faces personnel cuts, increased operations, and outsourcing and privatization competition, they need to view lean production as a matter of survival. It’s also the people that need to be involved with the changes, for the people most closest to the process best understand it and hold the solutions.

On the outermost ring is “dedicated facilitators.” These are the soldiers—the “spear and sword” of the system. They are the Quality and Manpower personnel who will assist in the daily implementation of lean production and who facilitate AWOs. Their role is to protect the innermost rings, leadership and system essentials. One way they can accomplish this is by ensuring successful results (2nd ring) are shared with leaders (inner ring) using the infrastructure (3rd ring) and with the people (4th ring). This illustrates the interdependency of the 5 rings as well. The facilitators need to have hands-on experience, understand the importance of the concepts and be able to foster leadership commitment. The facilitators, though, need to be given the time to become experts because it takes time to become proficient at facilitating lean production. The infrastructure of best idea sharing will aid in this area. This is especially done as there is an on-going exchange of knowledge and expertise.

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This exchange of lessons and ideas could become the very trademark of an organization that successfully implements lean production.

People detect a touch of scientific management as a part of the lean production concepts, and this usually carries a negative connotation. *The Principles of Scientific Management* by Fredrick Taylor was published in 1911, and dissenting views immediately appeared. Certainly the application of scientific management that caused alienation of work was harmful to worker productivity. Even so, we shouldn't throw out important concepts of Scientific Management. The New United Motor Manufacturing Inc. in Fremont, California successfully employed an innovative form of Taylor's time-and-motion study on the factory floor. The company created world-class productivity and quality while increasing worker motivation and satisfaction. The Mitsubishi Space Software Company in Tokyo states:

**“Scientific management has revolutionized the Japanese management and industrial system. We used to make products that the world thought were cheap but bad. Now they consider our products cheap but good. Unions welcome the growth in productivity and quality – it benefits us all.”**

Kaichiro Nishino of Shibaura Engineering sums it up:

**“Thus, we think that the fundamental problem is how to include the tradeoff relation between scientific management and human relations in the management of business. I think the so-called Japanese management style has succeeded in attaining a well-balanced trade off.”**

The Air Force will enjoy the benefits of the proper use of the scientific management when it employs the lean production concepts.

A word on standardization, which is tied to scientific management and is one lean production concept. Without standard work, there is nothing to build upon for continuous improvement. Without standards, waste and chaos enter the work place. An AWO demonstrated a valuable lesson. The team cut walking down from 3,700 feet to only 600 feet. A team member deviated from the “standards” and doubled the walking distance. The team was disappointed by the setback, but the lesson in the importance of standards was invaluable. Without standards, waste, such as walking returns. A major strength of lean production is standardization. The concepts also address standards in a way that prevents treating people like machines or from having standards that are little more than unseen words in a dusty binder in a cabinet. The AF recognizes the need to return to standards and lean production provides the way. Henry Ford was a strong advocate of standards, and though some may feel Ford over used standards, he recognized that they should come from within the unit, team, and person.

The real victory the AF can achieve through lean production will be in the change itself. Cycle time reduction is important, but the larger benefit of an organization improving its processes is a break from the past. The “sacred” processes are either no longer existent, or they are now seen as flawed (waste exits) and as an opportunity for improvement. A unit that had an AWO improved their processes during the AWO. It's what happened after the event that is important. Airmen

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started sharing idea after idea with the NCOIC. He allowed them to test their ideas and to make continual improvements. The AWO was successful, but the greatest success was in getting the unit started in improving their process. Further application of lean production, such as in the 5S and Visual Controls, provide direction to this energy and motivation.

The AF will have to train as it implements the lean production concepts on a broader scale. The author reluctantly mentions this because many AF leaders have lost confidence in quality training. The AF has moved to Just-in-Time training and lean production fits snugly into this training approach. In fact, the phrase “Just-in Time” is a lean production concept!

Teaching lean production answers many training questions. It provides a training focus on a subject that involves doing. The training on the practical rather than the theory gives students an application for their units. It's based on the needs of the AF to reduce waste. Lean production concepts are simple and this makes them easier for students to grasp. The concepts can be tied to squadron initiatives, such as implementing a 5S and Visual Control program so the training can easily match a commander's objective for the organization. This ensures leadership support and opportunities for students to apply what they've learned—an often missing ingredient in quality training of the past.

Training must be logically presented. The Air Mobility Command (AMC) has a three-step training process. The first involves student participation. Commanders give this before a lean production workshop to help prepare students. Context overview and organizational objective is briefly covered. A workshop follows about two weeks later. The workshop lasts eight hours. Students then enter the third stage of training which is the application of lean production to their processes. Training the concepts needs to follow a logical flow. AMC first shows students that their processes have waste. Students then learn how to find waste and then they apply the lessons by reducing waste. The flow is: 1) Realizing processes have waste; 2) Finding the waste; 3) Eliminating the waste.

A form of the Better Ball Bearing (BBB) exercise provides students hands on training in implementing the lean production concepts. The BBB exercise puts students in a simulated work environment where the job is to make ball bearings. Some students role play the workers, while others the baseline the process. All students join in for analysis, brainstorming, and implementation of ideas. The main objective of the BBB exercise is for students to practice implementing lean production in a safe environment before moving out to their own processes. The exercise helps students attain understanding, gain by it, and reduces stress during process change.

Lean production can deliver results to the AF at a time when they are most needed. The concepts are simple and yet still extremely effective. Never before has the need been greater for the AF to address efficiency and effectiveness. Lean production isn't a passing phase, but has proven its power over the past two to three decades creating the world's most competitive companies. Lean production systematically deployed throughout all processes is exactly what is needed to shape tomorrow's AF.



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# Computer-Supported Strategic Planning

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## Abstract

Strategic planning is seen as an essential part of establishing an organization's direction. Due to the Government Performance and Results Act (GPRA) mandate that all government organizations use strategic planning, more emphasis is directed toward the topic as organizations search for the best methods to develop strategic plans that integrate with organizational operations. Although strategic planning is utilized throughout the Air Force today in various forms, sessions can become time consuming without clear direction or structure to the planning. Computer-supported strategic planning is one avenue of making effective use of technology to improve the strategic planning process. This research implements a group support system (GSS) as a facilitation tool to improve the strategic planning process. The project was completed at Mountain Home Air Force Base with the support of the 366th Wing. The use of the group support system to augment the current strategic planning process was expected to provide these benefits: (1) improve the quality of the strategic plan, (2) reduce time to completion, (3) increase satisfaction with the process, and (4) increase commitment to the strategic plans developed. In general, computer-supported strategic planning improved the quality of the strategic plans, reduced time to completion, and increased the satisfaction with the process. There was not a statistically significant increase in the level of commitment to implementation but computer-supported strategic planning provided the opportunity to get more people involved in the process than traditional strategic planning which seemed to increase vested interest. Over time, more people will experience how their input makes a difference in the strategic planning process they are likely to increase buy-in.

## Mountain Home Air Force Base

In April 1991, the Department of Defense announced that Mountain Home would be the future site of a new Composite wing. Modern air warfare, as prosecuted so successfully in the Gulf War, requires aircraft of different types to fly together as a team. Air superiority aircraft such as the F-15C Eagle must sweep the sky of enemy fighters ahead of packages of strike aircraft, such as the F-16 Fighting Falcons and F-15E Strike Eagles, and bombers such as the B-1B Lancer. All aircraft must also be refueled in flight, which requires the integration of tanker aircraft such as the KC-135R into the attack.

The 366<sup>th</sup> is the Air Force's only permanent Air Expeditionary Wing and home of the Air Force's (strike "first") Air Expeditionary Battlelab. With such diverse forces, the 366<sup>th</sup> Wing has to cover a

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broad spectrum when developing strategic plans. The components of an expeditionary wing require a diverse group of units to fulfill their mission as a unified team. One aspect of the 366<sup>th</sup> Wing's mission is to develop and implement a strategic plan for the entire 366<sup>th</sup> Wing.

### **Quality in the Air Force**

In the Air Force, quality is a combination of leadership commitment and operating style that inspires trust, teamwork and continuous improvement. According to Dettmer (1995) quality has become a necessary condition, not a discriminator. At a Wing, quality is a thinking process which enables the entire unit to understand the effect of local actions and decision on the overall mission performance (Dettmer, 1995). Strategic planning is a process by which the entire organization envisions the future and develops a plan to weave quality into that future.

One method for an Air Force Wing to accomplish quality in a strategic planning process is to include a large number of the units in the development of the plan. Unfortunately practical constraints such as time or scheduling typically limit the number people who can be involved in a group process. If there are 20 members of a squadron leadership team that plan to work on developing action plans for 15 or more measurable objectives in an eight-hour period, the team shares 480 minutes. That leaves 32 minutes for each target and 1.6 minutes of talk time for each person in the group. These calculations are made without considering lunch or breaks so the 1.6 minutes will actually be less than a minute. If a facilitator controlled the interaction so each person in the group had less than 1.6 minutes to discuss an action plan, the participants would not have contributed much to the discussion or the decision. Thus, there would be difficulty inspiring trust and enabling the unit to understand the effects of local actions on the overall mission.

### **Strategic Planning in the Air Force**

Too often, strategic planning is treated as an annual paperwork exercise that has limited effect on the way organizations actually do business. Also the strategic planning process can frustrate the individuals who devote so much time to creating a product that usually only sits on a shelf. Few have promised that strategic planning would be easy, nor is there a guarantee of success.

If implementing strategic planning is so difficult, and takes so long, what incentive is there to do it? One important reason is that strategic planning helps organizations and individuals adapt to change. Change is not only certain, it is occurring at an accelerating pace. More than 80% of our technological innovations have occurred since 1900. Furthermore, it is predicted that the last fifteen years of this century will see at least as much technological change as the first 85! The Air Force has to be able to adapt to change more quickly than at any other time in history. But the Air Force must do more than just adapt to change. It must proceed proactively to decide what the future will be and shape it.

The articulation of a Wing's strategic plan is a mechanism for communication that promotes the coordination of activities and goals across the organization. In an attempt to simplify the strategic planning process, many units in the Air Force have adopted a hybrid of some of the more popular models. The culmination of models and methods has produced a model that the 366<sup>th</sup> used to develop strategic plans. Strategic planning requires a unit to establish a vision for the future,

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institute a mission statement, develop goals based on the mission, create objectives to meet the goals, establish targets, and write action plans to guide the unit in accomplishing the mission and goals of the organization. Target is a term used at the 366<sup>th</sup> to describe specific sub-objectives. The targets are necessary since goals and objectives are defined at the wing level. Subordinate units at the Group level specify sub-objectives (targets) and squadrons develop action plans to meet the Wing goals and objectives. When a subordinate unit hits a target the Wing's strategic plan is a step closer to completion.

Electronic meetings can help the Air Force adapt to change quickly by making group processes efficient. Air Force strategic planning teams need to meet and engage in planning processes that effectively coordinate time and resources to produce an optimal solution. A group support system (GSS) used in conjunction with facilitation expertise will demonstrate positive outcomes.

Group support systems allow large numbers of participants to interact as teams across all levels of an Air Force Wing. The Wing's squadrons are directly linked to the Wing Command, Wing Groups and Wing Staff through the computer's repository. When the group interaction is anonymous, the Airman has a voice as loud as the most senior officer. The GSS methodology developed in this research project allows the Air Force to produce quality strategic plans with effective use of resources.

### **Computer-mediated Strategic Planning**

A computer-mediated strategic planning process helps reduce the constraints associated with bringing a large group of people together to collaborate. Group support systems are technology designed to directly impact and change the behavior of groups to improve group effectiveness, efficiency and satisfaction (Nunamaker, Dennis, Valacich, Vogel, & George, 1991). GSSs have been designed to reduce the effects of the barriers to ideal group decision making (Adkins, 1994). According to Valacich, Dennis, and Nunamaker (1992), "a group support system (GSS), is described as an environment that contains a series of networked computer workstations that enable groups to meet face-to-face, with a computer-supported electronic communication channel used to support or replace verbal communication" (p. 49-50). When a GSS is applied to group decision making: (1) ideas can be exchanged between group members and organized into distinct categories, (2) the categories can be analyzed by group members exchanging information through electronic file folders, (3) consensus can be developed between group members, (4) data can be used and reviewed in future meetings, and (5) data can be exported to a superior or expert for critique or approval.

GSSs are being used with increasing frequency in a variety of organizations (c.f., Brashers, Adkins, & Meyers, 1994; Nunamaker, Briggs, Mittleman, Vogel, & Balthazard, 1997; Grohowski, McGoff, Vogel, Martz, & Nunamaker, 1990, study at IBM) where computer technology has been a vehicle for change. A GSS can have critical impacts on group interaction. For example, research has shown that in a face-to-face group meeting, 20% of the people do 80% of the talking because some group members are shy, of lesser status, intimidated, or too polite (Kirkpatrick, 1992). This lack of participation among group members may lead to lower overall productivity, or less critical evaluation of ideas. In an environment using a GSS, anonymous computer-mediated communication provides the opportunity for all group members to participate equally (Nunamaker, et al., 1991).

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Equal participation has the potential to improve the quality of interaction and perhaps to provide opportunity for more critical discussion of decision alternatives (Brashers, Adkins, & Meyers, 1994; Jessup & Valacich, 1993). Thus, people who have used GSS claim that these meetings are more effective than face-to-face interactions for group planning, problem solving, decision making, and group interaction (Dennis, Heminger, Nunamaker, & Vogel, 1990; Vogel, Martz, Nunamaker, Grohowski, & McGoff, 1990). GSSs were designed to overcome barriers that influence group decision making.

GroupSystems software is used in a GSS and was developed at the University of Arizona. GroupSystems software supports several different group tasks. This paper will focus on the support tools that are directly related to the process of computer-supported strategic planning. According to Nunamaker, Dennis, Valacich, Vogel, and George (1991) there is a common sequence of GSS use that is coupled with specific software tools. The standard GSS decision sequence is a five-stage process. First, a group leader meets with a facilitator to set an agenda for the meeting and decide what GroupSystem tools to use. Second, meetings usually begin with group members generating, exchanging, and evaluating ideas. Third, the ideas are organized into a manageable framework of distinct categories. Fourth, group members critique the categories. The emphasis in this stage is to understand the category and develop plans for how to activate the category. Fifth, group members attempt consensus building.

Typically, groups use an electronic brainstorming (EBS) tool to generate ideas. The tool is designed for group members to type in comments on a specific question shown on their screens. Once a group member enters in a comment the idea is randomly passed on to another group member. In addition, a list of all the ideas can be shown on the large screen in the front of the room and at each individual workstation. This tool is designed to allow group members to build on others' ideas without evaluation. Also, the tool can make all the comments submitted to the group anonymous.

In addition to EBS, there are two other tools that can be used for idea generation and evaluation. The first tool is topic commenter (TC). This tool function is like a set of index cards with topics written across the top of each card. A participant selects a specific topic card, enters comments and reads the comments submitted by other group members. The second tool, group outliner (GO) is very similar to TC but GO allows the group members to develop multiple sets of index cards in an indented outline structure. Usually, but not always, TC or GO are used after EBS as an organizational tool.

The idea generation tools, EBS, TC, and GO, are engineered to reduce the traditional constraints of a face-to-face meeting such as status pressure and turn taking obstacles. GSS provides a bridge over status and turn taking barriers so groups can develop exhaustive lists of ideas and solutions that solve problems and answer the group's questions.

Additional idea organization can be done with the categorizer tool. This tool provides a two-phase approach to idea organization. First, the tool allows group members to develop and analyze a list of categories and supporting ideas for each category in a number of different windows. New ideas can be generated with this tool and ideas from the EBS session can be incorporated into different categories. Second, the categories and the various supporting ideas in each category are consoli-

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dated. The consolidation process involves verbal interaction between the facilitator and the group members. The categories are usually analyzed for redundancy and combined into new or existing categories without deleting ideas.

After the categories have been created and analyzed the group attempts to build a consensus by using prioritizing tools. There are a variety of methods available to rank categories (e.g., yes/no, multiple choice, rank, agree/disagree scale). Alternative analysis enables the group to rate the alternatives in a multi-dimensional matrix then presents the results to the group on their individual screen and on the large projection screens in front of the room. Group survey allows each group member to fill out an electronic questionnaire. The questionnaire is usually preconstructed and designed to assess either a specific characteristic of the group (e.g., cohesiveness, level of group trust) or information about the available alternatives (e.g., are you satisfied with the alternatives). A group facilitator operates most of the GroupSystem tools and GSS technology.

### **The Role of Facilitation in Group Support Systems**

A meeting facilitator has multiple roles during a meeting (Nunamaker, et al., 1991). For example, the facilitator may be the group leader, a group member, or an individual that is separate from the group and neutral by decree. In most of the meetings that use GSS at the University of Arizona the facilitator is not a member of the group. The role of the facilitator is to provide technical support, plan an agenda, maintain an agenda, and set ongoing standards for how the GSS is used in an organization (Nunamaker et al., 1991).

Typically the facilitator's first encounter with the group is with the group's leader before the group meets. The facilitator and the group leader meet prior to the actual meeting to discuss the purpose of the meeting and make a plan to blend the GSS' tools with the intended goals for the meeting. A product from this meeting is a detailed script that outlines the structure of the group's meeting. The script indicates the specific phrasing of the questions or topics that will be addressed during the meeting, the group support system software tools that will be used and the length of time each tool is to be used by the group. After the preplan meeting the facilitator mediates between the structure of the preplan script and the actual group interaction by setting up the GSS' software tools and monitoring the group's process during the group's meeting.

When the group meets at the group support system facility the facilitator introduces the group to the tools and explains how the interaction is going to proceed. After introducing the tools, the facilitator explains the question or topic that is going to be addressed and discusses the structure of the meeting with the group. For example, the facilitator may tell the group that the EBS tool will be used to analyze the criteria against which Wing goals will be rank ordered. The technical role of the facilitator is to set up the software with the specific criteria and tell the group how EBS works. That is, tell the group that all the ideas are submitted anonymously (if that option is going to be used). Explain how EBS randomly passes each individual's ideas around to different group members, how a group member can comment on another group member's idea and then pass the original idea with comment on to another group member.

As a process monitor the facilitator keeps track of how long the group has been using a tool, suggests ways to increase productivity when using the tool, and tells the group when to move on

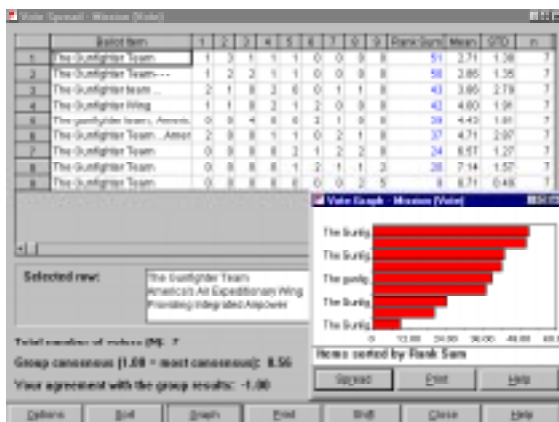


to another tool. The role of the facilitator is multifaceted. On one hand, a facilitator needs to have the technical knowledge and skill to use the tools provided in a GSS. On the other hand, a facilitator needs to be able to communicate with the group's leader to develop an agenda that meets the group's goals and to perform the agenda at the meeting. In an ideal situation determining the goal of the meeting and designing the process that the group should go through to achieve the desired outcome should be simple, but in actuality it is a complex communication task.

## Methods Overview

The study reported here is a case study at the 366<sup>th</sup> Wing on computer-supported strategic planning. A facilitation methodology for Air Force strategic planning was established using senior leadership at the 366<sup>th</sup> Wing. At the 366<sup>th</sup> Wing there is a Wing Command and five group level units: Wing Staff (WG), Operations Group (OG), Logistics Group (LG), Support Group (SPTG), and Medical Group (MDG). Each group is responsible for a number of squadrons and there are 24 squadrons in the 366<sup>th</sup> Wing. The first author worked with the 366<sup>th</sup> Wing command, three groups (OG, LG, SPTG), the 366<sup>th</sup> Wing staff, and seven squadrons using computer-supported strategic planning methods and a group support system. Eight external Quality Improvement officers evaluated 24 squadron level strategic plans. Quality questionnaires were administered to all squadrons ( $\alpha=.93$ ). Open-ended data was collected from squadrons using both traditional and computer-supported strategic planning methods. All squadron action plans were evaluated by a panel of seven experts using a quality scale ( $\alpha=.94$ )

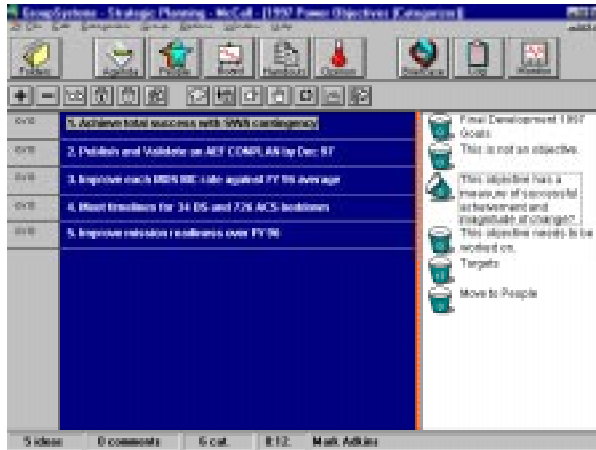
The computer supported strategic planning accomplished by the 366<sup>th</sup> Wing included three major areas: 1) Wing level strategic planning, 2) Group level strategic planning, and 3) Squadron level action planning. At the Wing level, members of the Wing Command met off site and used a deployable LAN consisting of networked laptop computers running Novel Netware and GroupSystems. The process to conduct the computer-supported strategic planning session included: the discussion of the function of mission and vision statements on-line; review of 1996 mission and vision statements in parallel with the other participants; group authoring of new mission and vision statements; the use of a nominal group technique and anonymous voting to select the final statements for the Wing. An example of the voting results is shown below.



The Wing Command then brainstormed ideas for Wing goals using the previously developed



mission and vision statements as a guide. Anonymous voting on the goals and refinement of the highest rated goals resulted in a final list of goals, which were used as a basis for the development of Wing objectives.



The Wing goals were placed in a hierarchical tree structure so those objectives that supported each goal could be generated in parallel. The objectives were reviewed against three criteria that had been developed previously: 1) This is not an objective, but is a candidate for Group level review, 2) This is an objective that requires additional work, or 3) This is an objective as written. The GroupSystems Categorizer was used to accomplish this task.

The Group Level strategic planning was accomplished in similar fashion. A tree structure of Wing goals and objectives was presented to the Group staff members for each of the Groups. Each Group staff developed targets in parallel and reviewed them against three criteria: 1) This is not a Group level target, 2) This is a Group level target that requires work, or 3) This is a Group level target as written. The targets were refined as needed and the group then moved on to the next objective. Once again, the voting and categorizer tools were used to accomplish these tasks.

The Squadron Level action planning for each of the seven squadrons utilizing the GSS followed a methodology that included review of the action plan definition, review of the function of an action plan, discussion of the action plan template, review of the Wing and Group goals, objectives, and targets, development of potential action plans in parallel, and finally comparison of action plans to criteria.

Action plans were defined as a link between day-to-day work place activities and the vision, mission, goals, and objectives of the Wing. Action plans should meet the needs of the squadron while being simple and easy to apply. They also had to be directed at processes that could be measured, analyzed, and improved. The design of the action plans was such that they were implementable, acceptable, and attainable. The action plan template used included a description, metric, milestone, success criteria, responsible authority, resource identification, and feedback mechanism.

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## Participants

There were 226 participants from the 366th Wing. At the squadron level there were 139 participants (Males=105, Females=21, n/a=13). The mean age of the squadron participants were  $\bar{M}=35.4$  and a range of 21 to 56 year of age. The majority of the squadron participants had participated in one or less computer supported meetings ( $N=107$ ). Representatives from 22 of 24 squadrons participated in the research project. Seven squadrons ( $N=92$ ) used computer-supported strategic planning methods and 17 squadrons ( $N=47$ ) used traditional strategic planning methods. A panel of seven external Quality Improvement officers were used to review the squadron's action plans. The reviewers had a mean of  $\bar{M}=20.1$  years of service in the Air Force and a mean of  $\bar{M}=2.96$  years working on strategic planning.

## Dependent Variables

A six item quality questionnaire ( $\alpha=.94$ ) was created for the reviewers to evaluate the action plans each squadron developed. The reviewers' questionnaire measured the quality of the action plans, achievability, buy-in, how well the action plans addressed the targets, and how clear the plans are measured. The 26 item satisfaction questionnaire ( $\alpha=.93$ ) measured satisfaction with the strategic planning process and commitment to the strategic plans produced. Time to completion was measured via a questionnaire and actual measurement.

## Results

The squadrons which used group support systems (GSS) to develop strategic plans developed higher quality strategic plans than those squadrons that did not use GSS ( $t(7)=3.47, p<.05$ ). There was no significant difference for commitment to implementation between the GSS and the non-GSS squadrons. Squadrons that used computer-supported strategic planning were more satisfied with the strategic planning process than those squadrons that used traditional strategic planning ( $t(137)=-2.28, p<.05$ ). The strategic planning process took an average of 17.7 hours for squadrons that did not use GSS and less than 8 hours for those squadrons that used GSS.

## Discussion

The external evaluation of the quality of the squadrons' strategic plans provides a strong indication that strategic plans created with computer-support are higher in quality than those strategic plans produced without the use of GSS. In addition to high quality, the computer-supported strategic plans addressed the Group's targets well and provided an action plan that had a specific measurable. Squadrons that used the computer-supported strategic planning methodology saw an increase in satisfaction with the overall strategic planning process. Also, there was a significant increase in the number of ideas generated and incorporated into the process as compared to traditional face-to-face strategic planning. The increase in satisfaction with the process should lead to higher quality strategic plans and greater and more detailed participation in the planning process.

Less time was used to develop action plans when the computer-supported strategic planning methodology was used. The non-GSS squadrons used perceptual data and the GSS groups' used actual data regarding time to completion. These data are fair to compare as several GSS users

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commented, in open-ended questionnaires, on how fast the strategic planning went when they used GSS. In the past, GSSs have been shown to both take advantage of parallel processing, and decrease the time to completion, so it seems reasonable that the same results are found in this case study. There was not a significant difference between GSS and non-GSS groups regarding commitment to implementation. When a participant is asked, "I am compelled to implement the action plan," the squadron members' Air Force training should dominate the group's thinking and the squadron should be committed to the strategic plan regardless of how the plan was developed.

Overall the study provides support for the claim that computer-supported strategic planning can assist the United States Air Force in planning for the future. Computer-supported strategic planning allowed a Wing of several thousand people to meet and develop a holistic strategic plan in less than three months. Computer-supported strategic planning allowed each level of the wing to build on previous level's ideas and comments. GSS allowed hundreds of people to be directly involved the strategic planning process. Involving large numbers of personnel in the planning process helps produce a high quality product that could not be developed practically using traditional face-to-face methodology. Computer-supported strategic planning assisted the United States Air Force in developing higher quality strategic plans in less time than traditional strategic planning methods.

### **Future Directions**

The computer-supported strategic planning methodology needs to be tested using multiple facilitators at a number of different United States Air Force Bases. The additional testing will provide generalizability for the computer-supported strategic planning methodology. In addition, researchers should work with Wing staffs and Groups to improve on the strategic planning process developed in this study. Investigators should focus on the link between objectives to targets and action plans. The link between these items is critical to developing a Wing wide strategic plan.

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Senior Master Sergeant Jerrold Strong has been married to the former Linda Lobdell of San Francisco for 28 years, and has two exceptional children. He has served as a Quality Advisor to the Commander, 60th Air Mobility Wing, Travis AFB, California since May 1992. As Superintendent of Wing Quality Training, he leads course development and deployment throughout the Air Force's largest Airlift Wing. He is an Examiner for California's State Quality Awards, and has been a guest speaker at county and state conferences.

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# Dignity — Missing in Action in the Workplace

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**Jerrold Strong**  
60th Air Mobility Wing

## ABSTRACT

It has always been easy to focus on how to do what we do in the Air Force, and our need for more and better tools and equipment, or ensuring we're doing things the right way, the first time. We are in an age where a quality force is essential and a few mistakes could cost you a career. We are in a system that espouses customer focus and quality values, but in practice our system values duplicity over integrity, selfishness over selflessness, uniformity over unity, and mediocrity over true excellence. People have four common desires: to live, to love, to learn, and to leave a legacy (Covey, 1995, 66). The lack of basic respect, dignity in the workplace, is a key barrier to realizing our Air Force core values, meeting our peoples' needs, and getting the job done with excellence. This paper will take a critical look at how our culture must change to align with our core values: Integrity First, Service before Self, and Excellence in All We Do, and why this is supremely more important than the technological, mechanical, and innovative things we can do to get better.

## Management Theory Overview

Theory	Characteristics	Criticism
Classical Scientific Management	Bureaucracy	Division of Labor — specialization
specifically defined Lines of Authority are set and good.	Close span of control	Rewards are based on output
If you follow the right procedures, the organization is efficient	Workers are motivated by money	Organization is seen as a machine, human needs are ignored
No one studies the environment and its impact	Rule violation is forbidden and not accounted for	Ignores the processes that really happen
Human Relations Theory	Humans are complex creatures — motivated by many things	Satisfaction comes through groups and social relations at work
Individuals should participate in management to feel commitment	Communication is necessary for the organization to function well	Interpersonal conflict for the best way
Work suffers from friendships in work relationships	Management manipulates the worker by human relations techniques	
Systems Approach	Open System	Techno / Socio - Tech
Organizations are systems within systems	Input - Throughput (processes) - Output - Feedback	Technology determines the informal system
Organizational structure depends on technology	Technology not integrated in open systems model	Focus on organization, not individuals
Organizational environment not a part of Techno/Socio-tech model		

## DIGNITY — MISSING IN ACTION

### People — our Most Important Resource?

The system Air Force people have pledged their lives and honor to is not mechanical, it is not technical, it is social. People do the mission. Technology, machinery, and equipment are tools in the hands of Air Force people. Frequently the words *People are our most important resource* is stated by senior leaders and found in master plans, and there are many functions and services offered to support people in the military, far more than in corporate America. But programs and services are not proof that the system appreciates the worth given to military people. We can list a multitude of things we do for our people in the military, yet, operationally the organization continually reinforces that *The Mission Comes First*. Now, this writer has never had a problem with that phrase. What this writer has had a problem with is how it is achieved. The intent of leadership is noble to acknowledge the importance of people, however, that intent is lost operationally. The operational definition of any command, policy, procedure, or request is not what you intended, but what the process actually gave you (Scherkenbach, 216). Most of my career, the task was preeminent. People were used and abused to get the job done. Completion at almost any cost was frequently the driver to meet the demands of some commander at whatever level. I am not saying that this experience is universal, but many I have talked with have experienced much the same. This has been an increasing problem with declining

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budgets and manpower, and the increase in our operations tempo.

Typically, when things aren't the way they should be and it comes to the attention of a Commander a new program is initiated to try and fix the problem. It seems that every time there is some unsatisfactory measure revealed in a briefing or a trend in data (two data points) going the wrong direction, a new program is created to address the issue, never mind that the numbers may be just random variation of events (Walton, 97). Not too long ago, Air Mobility Command (AMC) instructed all wings to implement a human dignity program. It was intended to assure equal treatment of all AMC personnel. Any discrimination would not be tolerated. I wondered how different this was from the already existing Social Actions and Equal Employment Opportunity programs? In any case, assuring the dignity of every member of the Air Force is very important. Two questions come to mind: how do we do that? Can it be done with a program? This writer doesn't think so. Before we can discuss the lack of dignity in the Air Force and possible approaches to achieve it, let us define 'Dignity.' For the purposes of this paper the definition is taken from the American Heritage Dictionary:

dig-ni-ty (dĭg'nî-tê) noun

plural dig-ni-ties

1. The quality or state of being **worthy of esteem or respect**.
2. Inherent nobility and **worth**: the dignity of honest labor.
3. a. Poise and self-respect. b. Stateliness and formality in manner and appearance.
4. The respect and honor associated with an important position.

[Middle English dignite, from Old French, from Latin dignitās, from dignus, worthy.]

(Note: the bold face is my emphasis)

Considering this definition, making every member of the Air Force feel valued and esteemed would be a proper goal. But it does not sound like a program, it sounds like culture. James Thurber, a U.S. humorist and illustrator wrote, "Human Dignity has gleamed only now and then and here and there, in lonely splendor, throughout the ages, a hope of the better men, never an achievement of the majority" (Columbia, 1993). I believe that dignity is at the very root of the Air Force Values. But to get there our culture has got to make some major changes.

### Integrity First

Integrity is *conforming reality to our words* — in other words, keeping promises and fulfilling expectations (Covey, 195). To exercise integrity means doing what we say, and that requires character and competence. This can best be described by something that General H. Norman Schwarzkopf said:

I've met a lot of leaders in the Army who were very competent — but they didn't have character. And for every job they did well, they sought reward in the form of promotions, in the form of awards and decorations, in the form of getting ahead at the expense of someone else, in the form of another piece of paper that awarded them another degree — a sure road to the top. You see, these were competent people, but they lacked character. I've also met a lot of leaders who had superb character but who lacked competence. They weren't willing to pay the price of leadership, to go the extra mile because that's what it took to be a great leader. And that's sort of what it's all about. To lead in the 21st century, to take soldiers, sailors, airmen into battle — you will be required to have both character and competence (Quotes, 15)

Integrity is being true to ones self. It may be demonstrated by doing the right thing when no one is looking, or being able to stand on principle even though you are in the minority.

Organizational plans are made, with leaders using all the right words. Tasks are developed based on organizational goals and objectives but those primarily responsible for accomplishing them don't take it upon themselves to follow-through with progress reports and task completion. Meetings are filled with unprepared managers and wasted time accomplishing nothing. Accountability is rare. Organizational plans are only books on the shelf. Management decisions are made based on very little data to drive towards results and the words used while writing plans seem to have disappeared, overshadowed by the urgency of the moment. The important takes a back-row seat to the urgent, work on results, people are a means to the end — better numbers. Duplicity is the reality within our management systems. Caught in the middle of organizational change we are trying to teach an elephant how to waltz. A generation of Air Force leaders and managers, raised on classical thinking of the "perfect process" and people as just another tool to get the job done, are being challenged with a blend of human relations concerns and a systems approach to doing work.

One of the way's of assuring dignity is having organizational values that guide our behavior and provide the standard for our decision making. Organizational leadership must reinforce the validity of those values by practicing



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them, and communicating them to team members constantly, modeling them consistently. The Air Force has a set of values, and we are addressing the first one here. If Air Force leaders don't consistently model Integrity First, a critical step in assuring the dignity of every Air Force member fails. People do what leaders do, not what they say. Organizational values are determined and printed in books and on cards, they are posted in hallways, and everyone else is expected to behave that way. However, the mission comes first, as long as we don't jeopardize the career of some young, fast track, manager. But woe to the worker that is involved when something goes wrong. No effort is made to model the values by leadership, just expected to be done by most everyone else — no integrity, no dignity. Denis Diderot, a French philosopher, said, "Every man has his dignity. I'm willing to forget mine, but at my own discretion and not when someone else tells me to" (Columbia, 1993). Leaders need to realize that their behavior defines what good looks like for the rest of the organization. If leaders are going to say we are a Quality organization then there should be no difficulty doing a Unit Self Assessment based on the Air Force Criteria, or being evaluated to validate it. They must integrate integrity into their lives first, then they will begin seeing a change in organizational behavior.

### **Service Before Self**

For "Service Before Self" to be a reality "Integrity First" must be true. Fear in the workplace is a major problem. Leaders need to coach and mentor people who are accountable for accomplishing projects and tasks, but too often, if things don't work out as well as intended the project leader is penalized, rather than leadership understanding that stuff happens, nothing is perfect. Variation exists in all things (Deming, 101). Most troubles and most possibilities for improvement add up to something like this: 94% belong to the system (the responsibility of management), 6% are attributable to special causes (Deming, 35). What Deming is saying is management designs and manages how work is done. It is those systems, procedures, and decisions on limited information that cause variation. It is more important to understand what happened, learn from it, make plans to improve based on those outcomes, change how things are done so that what went wrong won't happen again. Fear, however, incurs an inability to be honest because of the risk — telling the boss the bad news. Managers also think that holding on to information is necessary to maintain control rather than keeping everyone concerned in the loop. The emphasis is on selfishness not selflessness.

Taking care of the people we are responsible for is an inherent part of leadership and effective management. Virtually every professional military education course that deals with leadership and management speaks to this issue. Making a conscious effort to help every member reach professional and personal goals is every supervisor's responsibility. Copping out by saying "this is the military, if you do not like it — get out" is a poor excuse for ineffective leadership. What happens is that many of the good quality folks we need choose to leave. The Air Force is the worse for some idiot's inability to be concerned about taking care of somebody's needs; a very costly way to do business. The human side of getting things done is too often neglected. Leaders and managers seem to abdicate those responsibilities too frequently. Perhaps when the education level of the average American was sixth grade and rapid communication systems were non-existent organizing, directing, and controlling were essential to efficient production, appropriate in it's time. Today, the average education level of the enlistee is over one year of college. Global communications are instantaneous. Access to knowledge continues to increase exponentially. Our all volunteer force requires the use of different management skills to move beyond efficient, to become effective.

Another way to assure human dignity is to eliminate customs and regulations that devalue certain groups of people. Class structures in organizations often reinforce the attitudes that some people count and some do not. The rules of behavior between the classes encourage the devaluation of members in a particular class. Policies that force junior enlisted to live off base because they don't have the priority to rate on-base housing is one of the ways we punish the lower class rather than take care of them. Young married airmen are forced into the survival mode, working two jobs, spouse must work, child care cost are incurred, no telling the pressures imposed to make ends meet and support their family.

How do you assure human dignity when the system denies it? The politics of the military system denies individual dignity for some — fast tracks for officer promotions, square filling to meet promotion preferences with little thought to the impact on the organization, promotion boards concerned with who the senior endorser is on performance reports, and competitive reward and recognition systems, point to the winners and losers. Some count, some do not. Airmen who voice opinions are seen as trouble makers. The underlying culture says, listen closely, keep your mouth shut, and do what you are told. The boss will then go about telling exactly how to go about doing it. Then, if what is done is wrong or fails, the worker takes the heat even though they followed the bosses direction as understood. Why should I serve before self, what's in it for me? Differences are not appreciated. Everyone must look, act, and obey the same. Yet, differences are essential for balance and high performance of teams and organizations. "Organizational blind spots due to similarity of (personality) types and lack of a complementary vision plague many firms" (Kroeger, 98). Outdated management theory curses us to mediocrity unless we learn to evolve with it. The

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issue isn't who's more important than others, it is about the difference in roles, roles that are all important to get the job done.

### **Excellence In All We Do**

To achieve excellence in the work place leaders and managers must understand how work is done. All work is a process. To get things done with excellence requires a high level of interdependence and teamwork. From senior executives to the front line worker, each has important roles to play (Walton, 27). None is more important than the other, in terms of producing the product or service. However, system procedures and policies encourage individual competition for promotions and awards. Recognition is based on individual not team, internal competition and no cooperation. Everyone is supposed to cooperate and work together but the promotion system is individually competitive. There is a constant struggle to maintain dress and appearance - dealing with symptoms not causes, DUI's are symptoms not causes. Uniformity is expected, if not achieved the Uniform Code of Military Justice may apply. Excellence should be an outgrowth of our desire to achieve greater service and be appreciated when it is given. The system must be aligned in its reward and recognition policies and procedures with the organization's values to develop the intrinsic motivation of the people. Unity, working together, is more important and more effective. Uniformity can be more easily achieved if a unified identity exists, but that requires valuing differences and capitalizing on them effectively. To achieve a quality force, the rules about group study and test compromise in the promotion system need to be changed. People learn together more effectively. Test scores will rise, and so will promotion scores. But that is the point. Competency criteria for promotion, as well as rewards and recognition enables cooperation and teamwork. All those that meet the criteria get promoted or get the reward. If too many are achieving the required level of competence — raise the standard. The entire organization gets better together.

If leaders and managers don't change policies and procedures to reflect expected behavior, that is — teamwork, a level of performance significantly below excellence will result. The work place has had generally average performance for so long, this writer believes that leaders and managers have no clue of the potential that could be achieved from high performing work teams. If the Hawthorne studies proved anything they showed that if the workers felt that management cared, that feeling went a long way in developing their intrinsic motivation for improved performance. Service excellence can only be achieved when leaders model intended behaviors of the whole organization, seek to serve and coach members to continuously improve, and to align policies and procedures to the desired organizational culture. The organization must answer the WIIFM, the What's In It For Me for their members. But policies and procedures have to be aligned to the organizations values to change the culture of daily operations.

## **CONCLUSION**

### **If It Is To Be . . .**

Is a human dignity program an effective way to improve our situation? For it to be, the program membership would have to include the wing, group, squadron commanders, chiefs, first sergeants, managers and supervisors. Obviously not a practical approach. A problem is that programs allow leaders to delegate. Dignity becomes someone else's job. Perhaps this route is the typical one taken because leaders haven't developed the skills to practice what they say must be done. They know what's important, they just don't know how to do it.

The pressure to deal with the urgent, constantly, hinders their willingness to plan to get training. Also, typically, when we can get leaders trained their time is so precious, they get an executive summary of the training rather than the full course. This may be a half to one fourth of the learning experience. They achieve a knowledge level or at best comprehension level of learning while the workforce is at the application and analysis levels of learning. The result is that subordinates are better trained than the leaders! That is backwards. The experts, the best trained, should be the leaders, they set the example and must consistently communicate their lessons and model behaviors based on stated values, reinforcing and rewarding aligned actions throughout the organization. This doesn't mean that treating others with dignity is only the leaders job.

Assuring the dignity of our members is everyone's responsibility. The systemic issues must be addressed, and most are outside individual's sphere of influence. Fundamental changes in policies and procedures at the highest level must take place. They must be aligned with the stated values and operating style. Some people may not require that framework. At the most basic level, whether we are struggling with the management approach of Maslow's hierarchy of needs, or trying to differentiate between the maintenance factors and motivating factors of Herzberg's theory, or undecided whether to be a theory X or theory Y leader as described by McGregor, human dignity starts and ends with each one of us. Is each of us willing to put aside our selfishness and pride and become a little more caring? Are we managing our time wisely to focus on the human side of the mission? Can we find ways to increase the dignity of our

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members in every activity? Are we all willing to behave according to the organization's values? If it is to be, it must begin with me. I don't have control over my conditions, but I do have control of my decisions. Each of us must make that commitment.

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### **Capt. Ken Theriot**

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# We Can Predict The Future!

## The Magic of SPC

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**Abstract:** The theory of variation is at the core of the quality movement. Dr. Deming's 14 Points derive directly from the concepts of system variation, and statistical process control (SPC) is the tool he taught to measure that variation. The author explains how we can use SPC charts as *metrics* to measure process performance gives us knowledge about our processes that is extremely valuable in terms of driving action for improvement, analysis of trends, and especially, predicting future performance levels with near perfect accuracy. The analysis of process performance is particularly useful if process results are compared to some standard or specification. One can use control charts to tell whether the process will "bust" the standard or not, and how often, even if no data point has done so yet. This knowledge gives us the time to prevent those "non-conforming" situations before they occur. The author also points out that SPC need not be difficult to understand or use. Knowledge of statistics is not even a requirement. In addition, the author gives examples of how knowledge of variation is at the heart of the quality movement. Readers may expect to better understand the value of SPC and learn some tips to make it easy to begin using control charts immediately.

Wouldn't it be nice if we could predict the future? It would be like magic. Planning would certainly be easier. So would budgeting and scheduling. We could confidently answer those tough questions from the boss about whether or not a particular bad event would recur, or if defects were truly "on the rise." In most cases, we wouldn't need to spend as much time in meetings poring over process charts, analyzing, agonizing, and explaining each movement of the bar chart. This is not to mention the money we could make at the horse track, but I digress. We would *know* our performance levels and exact ability to meet the command standard not only for today and yesterday, but for tomorrow and beyond. With knowledge like that, we could stop looking backwards, and concentrate on the future. Well we *do* have that ability. By changing your current bar chart (or other trend-type graph) into a statistical process control (SPC) chart, you create a tool that is as good as a crystal ball, only lighter and not as hard to come by. A properly employed and interpreted control chart can predict future process performance and help us avoid wasting effort and resources. That information can then tell us when to act and when not to. It can also predict future failure rates, how to detect problems we didn't know were there, the scope of those problems, and what kind of corrective action is required.

### **SPC Started It All**

Most of us have heard the stories about Dr. W. Edwards Deming's trips to Japan that started the quality movement. However, he did not say to the Japanese, "keep doing business the way you always have, just start putting flow charts on the wall, and pepper your corporate lingo with buzz words (sound familiar?)." He told them that their fundamental thinking was at best, incomplete, and

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probably altogether wrong. Then he taught them about system variation and the devastating effects they would continue to experience if they didn't learn about it. Of course what followed was an explanation of how to measure system variation and what to do with that information, which was the major source of what he called "profound knowledge." The key to all this understanding was statistical process control.

A control chart is a time-series line chart with three horizontal lines on it, an average and two "control limits." The window marked off by the control limit boundaries defines the "inevitable" variation of the process being measured. This concept of "inevitable" variation is vital. Most people understand that every repeatable process has *some* random variation. For example, you do not arrive at work at exactly the same time every day. It *varies* by at least a minute or two for most of us. You've never signed your name exactly the same way twice. If we roll dice and the number gets bigger two times in a row, we chalk it up to chance. We expect these things to vary. Yet, when we examine process performance charts we suddenly feel like every up or down is indicative of something out-of-the-ordinary. If a graph shows two increases in a row, we say "it's on the rise," trying to explain away each and every movement. This is akin to assuming that the dice-roller did something specific to cause the numbers to go up. If I had that kind of control I would live in Las Vegas! So how can we know if a process really is changing? When should we assume that a particular fluctuation was too big to be considered part of the standard process? How many consecutive ups or downs represent a trend? Most of us don't know any standard tests. Ask anyone you know and they will tell you it is a "gut feel." Unfortunately, we cannot standardize gut-feelings.

Control charts allow us to use a standard set of interpretation tests. Figure 1 shows three such tests. These patterns represent *signals* of out-of-the-ordinary conditions called "assignable causes." There are actually seven or eight tests (depending on what textbook you read). Initially, we can simplify the analysis by looking for the three most visible signals. This will allow us to jump aboard and begin to use SPC quickly. Once we get used to it, we must add other tests to our toolboxes for a more thorough analysis of assignable causes.

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note: There are 4 other signals for ass. cause to be taught in a more advanced course.

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*Figure 1.*

To interpret the chart you must determine what kind of variation your process displays. If none of the "signals" in figure 1 occur on your chart, you should assume the process is stable and will continue to perform around the current average with *inevitable* variation between the two control limits. It is in statistical control. The variation we see is called "common-cause" variation. This is the kind of variation responsible for the numbers on dice being different every time you throw them. We can say with about 99.7% confidence that all data in the process will fall between these two lines, set at approximately three standard deviations either side of the mean (Pyzdek 14). However, just because your process is in control doesn't mean it's OK! It could be predictably bad. Likewise, just because you have signals of assignable causes doesn't mean the process is bad. It only means it is moving to a different level of performance. If you're moving from poor performance to improved performance, that's good. One of the most common mistakes I have seen people make while interpreting control charts is to say, "my process is in control so don't worry, it's OK." There should be no good or bad attached to control status. The control chart simply tells you whether the process is changing or stable.

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## **How Does This Allow Us To Predict The Future?**

You still may be wondering how any of this gives us the ability to predict the future. Remember what I said earlier about an in-control process? “It will continue to perform around the current average with *inevitable* variation between the two control limits.” You can say this with about 99 percent confidence. The reason for this is.... “inertia.” A body at rest tends to stay at rest. A body in motion tends to stay in motion. Have you ever tried to push a car? It took a great deal of effort to get it moving didn’t it? Then once it was moving, it took less effort to keep it in motion. Then it took a great deal of effort again to stop it. The difficulty in starting and stopping the car was inertia working against you. The relative ease of keeping the car moving was inertia working for you. Think of an in-control (stable) process as a car in motion. It will continue to roll as long as no fundamental change affects it. Thus, you can predict its future performance.

If you wish to stop or redirect the process, you will need to apply a great deal of effort. So you have two choices once you determine your process is in-statistical control. Either leave it alone, letting inertia work for you, or work against inertia to improve the process, if needed. In order to work against inertia, you usually need a team of cross-functional experts analyzing process design and sources of variation. Does this sound familiar? Once your team has affected the improvement, your chart should show signals of assignable-cause variation. For example, if your defect rate is too high, and your process is in control, your improvement project should generate a signal in the downward direction (seven points in a row below the mean, etc.).

On the other hand, if your process displays any signals of assignable-cause variation, it is considered to be “out of statistical control.” In these cases, assuming you did not create that condition through improvement actions, your only choice of action is to identify the cause and eliminate it.

You now have profound knowledge about your process. And knowledge is power. Your knowledge will give you even more power when your process is measured against a command standard. Remember my repeated comments about the variation of an in-control process *inevitably* fluctuating between the upper and lower control limits? This concept mandates that if your command standard line falls anywhere *between* the control limits, you have some measure of guaranteed failure!

Figure 2 shows an example of a process which is in control with the command standard between the control limits. Chart a. represents a process where the standard is about the same as the process average. In this case, you should expect to “bust” the standard about half the time. Chart b. shows the same process with a standard

*Figure 2.*

which is about half way between the average and the upper control limit. This will yield about a 10% failure rate. The reason for this is based on the theoretical model of the

- a.
- b.

normal or *bell-shaped* curve. The area under that curve suggests the probability of any event occurring. The curve above chart a. shows half the chart as an area of failure opportunity, like when the



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standard equals the average. However, because the normal curve slopes down so quickly, the probability at a point half way between the average and the end of the curve is closer to 10%, not 25% as might seem intuitive when shaded on rectangular shape like a control chart. Still, this shaded area does represent the approximate amount of failure you should expect to see in this process.

The true benefit of having this knowledge is that you can predict failure before it ever actually happens! Notice that on chart b. the first failure to meet command standard does not actually occur until September of that fiscal year. If you had the chart in January, you would have known that the process would fail to meet the standard about one month out of every ten, even though it hadn't yet. "Forewarned is forearmed," as the saying goes. You know you need to act even before an actual failure has occurred. The only question now is, "what kind of action should you take?"

*Figure 3.*

Earlier I mentioned that you have two choices of action for an in-control process. Figure 3 is a matrix to aid you in your decision.

Looking at the matrix, you select the action for an in-control process where the standard is between the control limits. That gives you quadrant 1 which says, "Guaranteed failure...long-term process redesign." This would require a cross-functional project with in-depth analysis such as PAT or "action workout" team. Your goal should be to attain a condition where the standard is no longer between your control limits. You may accomplish this by either reducing overall variation, thus compressing the control limits; lowering the average defect rate; or a combination of both.

### **What Is The Result Of Not Having This Knowledge?**

Let's imagine how most of us would have reacted before we had this knowledge. We would likely have been looking at a bar chart with no average or control limits depicted. The command standard line would have been drawn prominently across the chart. Each month, we would have concluded that since we met the standard, there was no cause for concern. I call this the "next slide, please" syndrome. Dr. Donald Wheeler calls it "benign neglect (Wheeler 18)." We would have coasted along doing nothing to improve this process until September when we failed to meet the standard. At that point, we would automatically assume that something specific, and confined to the month of September, caused the out-of-standard condition. We probably would have asked for causes and demanded immediate action to correct the situation...*seek and destroy*. One look at our action matrix will tell you that this is the wrong action. That method should be reserved for out-of-control conditions. Taking that approach with an in-control process will, at best, have no effect. Most likely, it will increase overall variation in the process. Dr. Wheeler calls this "intense panic."

...Thus one is continually experiencing periods of benign neglect alternating with periods of intense panic. This on-again/off-again approach causes a binary world view and is the complete antithesis of continuous improvement (Wheeler 18).

In addition to the two mistakes mentioned above, we would have found ourselves feeling like we didn't have time to use the longer-term PAT-type continuous improvement process (CIP). I have heard that comment many times. "We don't have time to wait four-to-six months to fix this!" But you had time four-to-six months ago to relax and say "next slide please." Let's take a look at what this kind of mistake can cost us.

We continue with our inappropriate improvement action, panicking and blaming workers,

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which won't solve anything for the long term. Because the underlying process was not changed, our failure percentage remains at 10 %. In October, our process falls back into standards, as an in-control process will randomly do. But we will take credit for the supposed "improvement," and our inappropriate behavior is reinforced. This is an example of "superstitious learning" (Sherkenbach 14). So in March, when we bust the standard again (by chance...by design), we will repeat our earlier mistakes, having no positive effect. The process will randomly come back into standard and we will again take credit and feel reinforced for our wrong behavior. This cycle continues over and over again. We feel productive because we are so busy putting out fires and controlling the workers, demanding that they meet the standard. The workers become fearful and start getting creative about reporting. After all, they don't have the resources to initiate a long-term, cross-functional project to make the necessary improvements. They act out of self-defense. This will inevitably lead to more problems in the process, which will make this cycle more frequent, and thus our trouble snowballs. We are now busier than ever trying to stay above water.

All of these problems are typical results of not knowing about system variation. SPC can allow us to obtain *profound knowledge* about our processes that will help us avoid these problems before they occur. Dr. Deming taught a fourteen-point quality system which became a sort of template for Quality Air Force (QAF). Unfortunately, most people are taught what to do, but not why. Most quality awareness courses don't address system variation and SPC as the heart of the matter, if they address them at all. We are simply taught that we need to start engendering trust, empowerment, defect-prevention, and continuous improvement. When we see what problems we can avoid through the proper action based on system knowledge, the reasons for *doing that quality stuff* become much more clear and compelling.

### **So How Do I Get This Started?**

First of all, you must ensure top management understands these concepts. Assuming they do, your next step is to choose a key process which is already charted over some time period. You should have at least five data points. Then you need to decide what control chart to use.

There are six different types of control charts. Each has a unique purpose. The chart we must use is called "the individual and moving range" chart (x/mR). The other charts may only be used with a certain type of data, which is sometimes difficult to identify. If you use the wrong chart with the wrong data, your chart will be wrong, and therefore, useless. But the x/mR chart may be used with any type of data...the universal chart, you might say. This concept allows us to make wide-spread use of the chart (Wheeler, ??). Once we become familiar with the correct usage of the other charts, it will be appropriate to use them, but not before.

*Figure 3.*

X & mR charts come in two parts. The top chart is the actual process performance, and the bottom one plots the movement (range) between each point plotted. See Figure 3 as a generic example. In order to reduce confusion and get people using SPC more quickly, we display only the individual (top) portion of the chart during briefings and on walls. Once people get used to using control charts, we may want to add the second chart. However, personnel calculating the charts should know about the importance of the moving range and how to check the mR chart for assignable causes.

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The next step is to calculate the average and control limits. Many software programs can do this for you. Once you have done that, plot your performance on the chart using a line graph. Voila! You have yourself a control chart. Simply apply the tests for variation-type and decide what action, if any, you need to take. Teach interpretation to all personnel. No knowledge of statistics is required to use SPC. However, someone in your organization should be trained on the background theory and some statistics to act as the consultant and ensure proper usage.

### **Tips For Using Control Charts**

If you have one point outside the control limits after your initial calculation, recalculate and don't include that point. Remember, your control limits and average define the normal behavior of a process. You don't want an out-of-the ordinary point to skew your data. However, **you must still show that point on the graph.** This point will still show as an assignable cause on your chart and should be explained and acted upon if possible.

Once you have your average and control limits calculated, do not recalculate them again unless you have evidence that the process has changed. If possible, extend the limits and average into the blank portion of the chart representing the future. Simply plot each subsequent data point as you always have done. Now you can measure all future points against the baseline process. If you recalculate for every new point, your chart becomes less sensitive to signals of assignable causes of variation.

If you do experience a shift in the process average, you can highlight that by breaking the control limits and average at the point of change. Recalculate your new process limits and average, and plot them on the same chart. This lets everyone see how the process is behaving.

Do not use try to draw a "trend line" on your chart. Many software programs will try to interpolate future performance by drawing a so-called trend line through the general shape of your data. These are misleading. Stick with the standardized tests for control and stability to tell you where the process is going.

### **Go Forth And Do Good**

You now have enough information to get you started. You can build a control chart with parts you probably have around the office. You will likely be able to use the same data you've been collecting all along. SPC can give you the knowledge you need to predict future performance levels. This knowledge will allow you act on processes before they ever fail to meet standards. The actions indicated by proper interpretation will also prevent wasted effort and resources while engendering continuous improvement. The benefits associated with understanding system variation are huge compared to the relatively small investment needed to begin using control charts. SPC is the fundamental concept behind most of the key quality concepts and tells us why we were trying to implement QAF in the first place. Now that you know how to predict the future, it doesn't seem so much like magic after all does it?

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# Blending Action Workout and Re-engineering

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**Capt. Marci Townsend**

ACCQMIS

## Abstract

This paper explores and combines different theories of organizational change and how they can be used to influence organization-wide improvements. Action Workout is a structured process to produce dramatic organizational improvements and was adopted by Air Combat Command from General Electric's Action Workout program several years ago. The successes of AWO have been impressive enough to earn Vice President Al Gore's Reinventing Government "Hammer Award." There is a need though to take Action Workout's successes to a new level by combining it with the powerful tools and ideas found in reengineering and a process to do just that is proposed here.

*"Every time we were beginning to form up into teams, we would be reorganized. I was to learn later in life that we tend to meet any new situation by reorganization...and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency and demoralization." - Gaius Petronius Arbiter, Died 66 AD*

## Introduction to Action Workout

Action Workout (AWO), is a rapid, concentrated and high-energy team effort to create and implement dramatic organizational changes. The Action Workout process has been applied to a variety of different key processes around Air Combat Command and the Air Force for the past two years with much success.

## Action Workout as an Approach to Organizational Innovation

In order to survive and prosper in the future, organizations will need to be able to become highly adaptable in response not only to new technology, but also to new ideas. As we move further into the information age, the production and adaptation of new ideas will continue to accelerate. Organizations will need to sort through massive amounts of innovations to determine which ones to adopt, and which ones to reject. In our society, innovation is associated with success, while failure to innovate or stability is associated with failure (Daft, 1982, p. 130). Daft pointed out that organizations need to somehow resolve the dilemma between needing to have both stability and innovation. Bart also felt that innovation was key to the growth and continued profitability of not only businesses, but even of our society in general as we move into a future where change becomes even more rapid (1994). Unfortunately, Bart also pointed out that, "...innovation remains one of the most poorly undertaken functions within the modern North American organization" (p. 26). Part of the reason for this is that organizations are not set up to deal with innovations well because of their structures. There are many forms of organizational structure, some of which are very formal and mechanistic and some which lean more towards informal structures and are more organic in nature. Organizations which rely on highly structured, bureaucratic methods of organizing are not able to deal with innovations as rapidly as other organizational forms. This is especially true for a military organization which lives by a highly structured form of organization. Rogers and Agarwala-Rogers (1976) remind us that bureaucracies were created to handle routine tasks and to lend stability to human relationships. This inherent stability makes the mechanistic organization very efficient in organizing. Yet, even in organizations like this Rogers and Agarwala-Rogers say that innovation is going on all the time and that the innovation process should be considered one of the main functions in organizations (p. 149). Not all organizations are able to easily reconstruct themselves into an organic structure, so there is an imperative to find ways to foster innovation and change even in the most hierarchical and mechanistic organizations. Action Workout provides a framework for innovation that can fit into any organizational structure, no matter how highly structured or hierarchical it is.

## Attributes of Innovations and Organizational Changes

Rogers proposed five attributes of innovations to help define how dramatic a change they would entail and help predict how widespread and how quickly the innovation would be adopted including: relative advantage, compatibility, complexity, trialability and observability (1983, p. 211). These attributes refer to whether the individual who is considering adoption of the innovation sees it as having an advantage over whatever thing or method is currently being used (relative advantage), whether or not it is compatible with whatever is currently being used (compatibility), how complex or difficult the innovation is to understand (complexity), whether it can be used on a trial basis before wholesale adoption (trialability) and whether they can watch others successfully use the innovation before adoption (observability). It is also important to note that the *actual* advantage of the innovation over whatever it is replacing is not as important as how much the potential adopter *perceives* its advantage to be making perceptions of all of the other attributes of compatibil-

ity, complexity, trialability and observability of the innovation even more important (Becker, 1970, Lancaster & Taylor 1986). One of the advantages of Action Workout is that it maximizes each of these five attributes of innovations and contributes significantly to the adoption of the innovations that result from an AWO. Usually, the individuals who will be adopting the innovations or changes being suggested are either on the team or consulted by the AWO team members. This means that it will be very clear whether or not the adopter perceives the change to have an advantage over the current work processes and it will also be immediately clear whether or not it is compatible with the current work processes. One of the concepts taught as part of AWO is to make the improved process as simple as possible so complexity is reduced and the changes are often easier to understand than current work processes. Finally, trialability and observability are included in the AWO “Trystorming” process. Throughout the Action Workout event, participants are encouraged to not just discuss ideas, but to immediately go give them a try. Participants are told that they should only discard an idea if it violates safety, they can’t get it to work, or they can get it to work but it adds to the cycle time and man hours to the task. Overall, the process used for AWO incorporates all of the research on how to make an innovation more likely to be adopted.

### Reengineering as an Organizational Change Strategy

During more recent Action Workout events, the issue of looking at the entire process from end to end has been raised. Combining improvement efforts for the entire process together with improving individual tasks was something that is being encountered more and more by Action Workout teams. Lessons and concepts from re-engineering strategies provide several insights into alternative change strategies that can be used in these situations. According to Hammer and Champy re-engineering is defined as “...the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed” (1993, p. 32). They stressed that re-engineering goes beyond just deciding *how* tasks should be done, but starts with determining *what* the organization should be doing, then figures out how to do those things that are left. Most of the problems which remain after an AWO are systemic and parallel processes that need to be flowed together more smoothly. Normally, AWO breaks the process down into different tasks so that each team can crunch time out of their particular part of the process. Some Action Workouts are significantly different when participants start to show an interest in improving the big picture and looking for broad brush improvements such as communication. Where AWOs have normally focused on work process re-engineering, this project leans more towards true re-engineering in the organizational sense. Hammer and Champy emphasized that just working to improve small parts of a process could be dangerous because they could further complicate the current process, make it more difficult to figure out, and make people less likely to dump the process later on because they have invested extra time and money into improving it (p. 205). Hammer emphasized that re-engineering is not about improving processes that are already in place, but about “...throwing it away and starting over; beginning with the proverbial clean slate and reinventing how you do your work” (1995, p. 4).

It could be expected that an organizational change process this dramatic could have a hard time being successful. Hammer emphasized that while many think that 50 to 70 percent of all re-engineering projects will fail, it is only because the organizations taking on these projects did not pursue re-engineering the right way (1995). Some of the failures which have been attributed to this high failure rate of re-engineering were really small quality improvement efforts, a thinly veiled attempt at downsizing or the installation of a new computer system (Hammer). Hammer asserted that many re-engineering projects which have been labeled failures should never have been considered to be re-engineering projects at all.

One reason cited for the failure of many re-engineering efforts is that they are actually regular quality improvement efforts and as Hyde noted, TQM has been criticized in the past for not focusing enough on results and being much too long term in its goals (1993). For some time now, there has been a debate as to how different re-engineering really is from quality improvement. Hammer stressed that both have several points in common but that there are many differences which are summarized in Figure 1.

#### **Re-engineering**

Macro perspective

Discards process entirely and replaces with newly created a process

Looks at process as a whole and reorganizes and restructures how tasks are combined

techniques to optimize individual tasks within a process

Dramatic Improvements (50-80%)

#### **Quality**

Micro perspective - isolates narrowly confined difficulties

Improves existing process

Uses Industrial Engineering

Incremental Improvements (10%)

**Figure 1.** Differences between Re-engineering and Quality (adapted from Hammer, 1995, p. 172-173).



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While Action Workout achieves dramatic improvements, everything else it does falls under the “Quality” column in Figure 1. Actually, the differences between the two may not be as dramatic as Hammer made them out to be. Cole pointed out that many of the claims Hammer and Champy made in their 1993 book about re-engineering successes were not necessarily the result of true re-engineering efforts according to their own definition of re-engineering (1994). Cole pointed out how the example of Taco Bell’s improvements used by Hammer and Champy were “...basically about growing a business and involves de layering, incorporating radical new technology, and thinking of opportunities for reaching an expanding set of customers. It can be called re-engineering, but then re-engineering becomes just another name for any large-scale innovation and creative activities” (p. 78). Re-engineering may not be the big leap away from quality that Hammer and Champy made it out to be and Cole pointed out that the re-engineering movement could never have happened without being preceded by the quality movement anyway. There is no need then to confine improvement efforts to one pigeon-hole or the other and it could be possible to have both large-scale redesign and small-scale redesigns taking place at the same time. While Hammer and Champy emphasized the *differences* between quality and re-engineering, Cole pointed out many similarities which were mentioned by Hammer and Champy themselves and are fundamental to AWO events:

- Having workers make the decisions and giving them more challenging work through the process team concept.
- Simplifying processes.
- Emphasizing management responsibility for maintaining business processes, especially those that cross departmental boundaries.
- Giving front-line workers more discretion to meet customer needs.
- Creating partnerships with suppliers and customers (Cole, p. 81).

All of these things were used by Hammer and Champy to describe what a re-engineered process looks like and they sure look similar to the things that quality improvement strives to do. Likewise, Action Workout does not need to confine its efforts to the limitations of just tackling incremental improvements, but needs to step into the realm of re-engineering entire processes.

#### Integrating Action Workout and Re-engineering

According to Hammer the reason many organizations began to use complete process re-engineering to fix their problems was because they realized that they were getting nowhere applying task solutions to process problems and that problems which hurt them the most were process problems not just task problems (1996). He emphasized that one-shot improvements, even the ones as dramatic as the Action Workout results are of little value if the organization does not strive to become process centered and to improve the processes which are key to their survival. In addition to not focusing on the overall process, Lathin wrote that one of the biggest constraints we put on our improvement efforts is to not change existing organizational structures, but attempt to make changes that “...conform to existing functional silos” (1995, p. 60). On top of all of this, as we move further into the information age, more and more organizational processes will be based not upon industrial processes, but administrative processes. According to Hyde (1993) information and communication technology will play a pivotal role in determining the flow of any process including what its cycle time will be, and how connected and controlled it will be. This means that information management will become a more vital aspect of any redesign process. Unfortunately, *all* of these things are specifically ignored or rejected as not being “part of the way Action Workout is done.”

The improvement process used in Action Workout has proven to be truly effective in improving numerous industrial processes in the past. For the future, the Action Workout process itself needs to be taken to a new level to meet customer demand for overall organizational improvements through process re-engineering—even if the process they want to improve is an administrative process. Past improvements have demonstrated that the members selected at each organization to be Action Workout team members have proven to be very creative in forming solutions to problems. There is no reason why these same types of teams could not be used to reengineer their processes or redesign their organizations. With the proper leadership support and guidance, these personnel who work the process on a daily basis would be the best candidates to make massive improvements.

Tackling re-engineering and administrative processes would almost require another version of Action Workout, yet it would not be extremely difficult to build on the existing AWO process. Figure 2 shows the current five steps in the Action Workout process and how the steps of a re-engineering process could be built into the framework of

AWO.

### ***AWO Step***

### ***Revised AWO/Reengineering Steps***

Step 1. Identify Need 1 . Collect data on current processes and see which one is causing the most problems.

Which processes are the customers least happy with? What has the greatest impact on external customers? What process has the best potential payoff if it is improved? 2. Select process to improve. 3. Leadership meeting one-on-one with AWO Team Chief to define scope of project and boundaries. Leadership should bring: clear goals and expectations, available resources and constraints, and a calendar of events that could impact the project. 4. Leadership establishes a time-table for this event. 5. A proposed schedule is approved by highest levels of leadership affected by the project.

Step 2. Site Visit 1 . Team members selected by the organization conducting the project. 2. Leadership is oriented by AWO Team Chief to their role, the importance of showing visible support. 3. Team members trained (This training piece should include: process for the week-long event, team issues and roles, brainstorming and creativity, process redesign principles and organizational structure and redesign.) 4. Ensure that process can be simulated if not observed. Walk or "see" process. (Computer simulation may be used during the event itself.)

Step 3. Unit Prep and Data Review 1 . Team members collect data on the environment, the process and the human structure and support systems: 2. Environment: Groups and customers outside the group that influence it. Any strategic plans, goals and objectives. 3. Process: Work flow, Information flow, Output requirements and deficiencies 4. Human Structure and Support Systems: Structure, lines of authority and coordination, how people are organized, directed and coordinated. Job design: how work gets distributed into individual jobs.

How people are selected, trained, evaluated, disciplined and rewarded. Values and norms: formally and informally what gets rewarded and what do people think is important (Hupp, Polak, & Westgaard, 1995). 5. Team members collect: samples of forms/ files reports/paperwork/logs or tracking databases. 6. Team members also collect data on: Number of hand off's in the process, queue and wait time, distance traveled, number of copies made, etc.

Step 4. Action Workout Event 1 6 . Start by creating vision for ideal process (Couger, Flynn and Hellyer (1994) provided a method to start with wishful thinking using a fantasy statement such as, "If you could imagine this process being anything at all you wanted or could do this any way you want, it would be..." Next you look at each statement and use statements such as "Although I really can not do that, I can do this by..." or "It seems impractical to do that, but we can accomplish the same thing by..." 17. Envision the ideal internal process. 18. Envision the ideal external process. (If you could get your customers to do anything...) 19. Integrate these visions and create subvisions. 20. With the vision on the far right end of a blank wall, work backwards to recreate the process and redesign the organization. Consider the following along the way: 21. Benchmark off of other organizations and processes. 22. Determine performance drivers. 23. Challenge each and every step and eliminate waste. 24. Strive for parallel/concurrent processes 25. Include information flow as part of reengineered process or depict the info flow separately. 26. Within available resources, apply technology - justify need for technology outside budget. 27. Define the new jobs and teams that will be needed. 28. Determine what skills will be needed for each job. 29. Redraw the organization - create work cells or virtual work cells if at all possible (i.e. people meet at the office at a predetermined time to complete a project.) 30. Draft the new physical workflow layout and simulate.

Step 5. Follow-up Actions 1 6 . Hold an implementation planning meeting 17. Identify driving and restraining forces that will influence progress towards the new reengineered system. 18. Cluster these forces into categories of similar types and influence. 19. Prioritize the categories by their level of impact by voting. 20. Brainstorm strategies to minimize the restraining forces. (Process from Hupp, et al., 1995). 21. Finish developing any new technical applications. 22. Train everyone. 23. Pilot the new process 24. Meet regularly to: celebrate milestones and successes, trouble shoot, share lessons learned and experiment with new ways to do things. 25. Continually refine and improve the process.

Figure 2. Steps for blending AWO and Re-engineering.

This method could also be combined with the "industrial type" Action Workout. Both efforts *could* take place concurrently with separate Action Workout teams working on improving specific tasks (Task Teams) and also a Core Action Workout team which looked at improving the overall process (the Core Team). This Core Team could consist of a Core Team Leader and the leaders from each of the other Action Workout task teams. Days one and two of the event week would consist of efforts by the Core Team to redesign the process as a whole. On the second half of day two each individual Action Workout task team could begin to improve specific tasks within the process. (This is a day and a half later than the current AWO process.) Team leaders would meet briefly with their Task Teams each morning to get

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inputs on improving the overall process and to get the team started on task improvements. They would then attend a daily core team meeting where the overall process is defined further. These Task Teams would continue their improvement efforts throughout the week while their team leaders were meeting each morning for one to two hours to continue redesigning the process as a whole with the rest of the Core Team. These team leaders would then take any new or relevant information back to their teams and continue working the rest of the day on task improvement. At the end of each day, each team would still brief their task improvements, while the Core Team leader briefs overall process changes and improvements. This Core Team leader would need to be an individual who is not a team leader on any of the other teams, but can focus on the overall process. This person should also be able to coordinate well with others so that while the other Core Team members are leading their own teams in task improvements, this individual could be coordinating with other agencies and groups on the changes that were made in each morning's meeting. This revised AWO process would obviously be more intensive for the team members, especially the team leaders who are participating on more than one team. Additional preparation before the event week to not only gather data on the current process, but also to start developing improvement ideas would help minimize this time-crunch somewhat. It is also important to note that having a coach for each team will help them to remain focused even while their team leader is absent.

### Conclusions

Action Workout has clearly demonstrated that it can have a significant impact on improving processes and products and this case study demonstrated that AWO can also have an impact on the participants. This particular Action Workout highlighted a struggle between whether to improve the overall process or to focus only on tasks within the process. While the "new and improved" Action Workout process proposed here may seem radical to some, it could help meet the customer demand to re-engineer entire processes and also their demand to improve administrative processes. General Hawley, the Commander of Air Combat Command has mandated that we need to conduct between 18 and 24 Action Workouts in 1997. This means that we cannot afford to turn requests away just because they do not "fit" with Action Workout as we have always done it in the past. What we need to do is improve Action Workout. If we confine Action Workout to a narrowly specified area for improvement then not only will we miss opportunities to make tremendous gains in process and product improvements, but as this case study showed, a great deal of individuals will miss a chance to participate in an Action Workout which means we will also miss an opportunity to improve morale in many corners of the Air Force.

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## Joseph Wible Jr

Joseph Wible Jr., is a speaker, trainer, and consultant specializing in the design and implementation of Total Quality Management systems and the application of quality concepts.

Joe has provided services to several clients in both the private and public sector organizations for the last several years. His work has benefited a wide variety of industries, including manufacturing companies, professional services, and government agencies. Currently, he is employed as the Quality Officer for the 931st Air Refueling Group, McConnell Air Force Base.

An active educator, Joe has developed, taught, and coordinated classes, seminars, and workshops on Total Quality Management. Over the last several years he has provided classes regarding statistical process control, total quality management awareness, strategic planning, conflict management, facilitation, quality advisor/leader, quality improvement team, organizational assessment (Baldrige and ISO), and quality metrics.

Joe is a member of the American Society for Quality Control. He is on the Board of Directors for the Kansas Quality Award for Excellence. He is the Senior Baldrige Judge for the State of Kansas's Quality Award. He is also the lead instructor of the Baldrige Examiners for the State Of Kansas. He earned his bachelor of Arts degree, from Youngstown State University, with a major in Labor Relations. He completed his Masters of Science degree, from the school of Commercial and Industrial Economics, from Pacific Western University, with a major in Quality Management. He completed his Doctor of Philosophy degree from Pacific Western University, with a major in Public Administration, with an emphasis in Total Quality Management. He is an active professor with Friends University, Kansas Newman College, and Southwestern College instructing at the undergraduate and graduate degree programs in Quality Management. He is on the Advisory Council for Friends University associated with the Quality Management Bachelor and Masters Degree programs.

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# SHAPING TOMORROW'S AIR FORCE

## Three Elements That Make Organizations Successful

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**Joseph Wible Jr.**

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### ABSTRACT

Recent changes in the world and in our nation have resulted in dramatic reductions and downsizing of the military forces. A fundamental change in the way we conduct business known as the Quality Air Force (QAF) philosophy has been implemented throughout the United States Air Force, based upon the three fundamental elements of employee participation, what gets measured gets done, and policy deployment the "Cascade Effect." It is these core concepts that provide a foundation of Quality, focused on customer satisfaction and continuous improvement. They are the essential principles for a successful organization and they will guide and shape tomorrow's Air Force.

### The Industrial Revolution

The early immigrants faced the opportunities associated with the wealth of natural resources of their new world. An innovative spirit emerged and became the driving force when the new nation undertook industrialization. Self reliance and risk taking became part of the respected traditions of a hard worker and provider.

These traditions in turn raised individualism and entrepreneurship to a state of respect. During the nation's progress to industrialism the immigrants approach to manufacturing tended to follow the craftsmanship concepts which were very prevalent in Europe. A young man learned a skilled trade as an apprentice all the way through the level of master. The master tradesman trained the apprentice in how to produce the product. The master also maintained a form of quality control by inspecting the goods before sale.

Once the apprentice had learned his trade, he became self-employed or employed by the master of a small shop. Quality under craftsmanship was usually handled by the craftsmen. Achievement of quality was one of the essential skills learned by the apprentice. Most goods were sold locally, so the craftsman had a large personal stake in meeting the customer's expectations for quality.

The Industrial Revolution, originating in Europe, created the factory system. The factory system usually subdivided former trades into multiple, specialized tasks. It soon out-produced the craftsmen and the small independent shops, and made them largely obsolete. It forced many craftsmen to become factory workers. and many shop owners to become production supervisors.

Managing for quality remained a production function. Large production departments employed

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full-time inspectors, who reported to their respective production supervisors. Quality was assured through the skills of the workers, supplemented by supervisory audit or by departmental inspectors.

By 1911 the industrial revolution had come to a close, and the factories had won out over the craftsmen. By the end of 1912 a large majority of the work force was employed within the factories and a new management philosophy was emerging. This new philosophy would be the beginnings of a foundational awareness of what it takes to be a successful organization. This becomes the first of three elements which emerge and by 1950 as guiding principles to make an organization successful. This institutionalized the process of what Armand Feigenbaum wrote as his doctoral dissertation and later published as a book in 1951 entitled, "Total Quality Control." The illustration below represents those three principles.

## **Foundation Of Quality: Customer Satisfaction and Continuous Improvement**

Customer Satisfaction has been a key element to any organization's success. The master craftsman knew it and so does the factory worker. However, the focus of who the customer is changed in the 19th century. Prior to the industrial revolution the craftsman had direct contact with the customer because he passed on his product and services directly to the customer. In most cases the craftsman controlled the complete process, and the end product he produced was handed directly to the customers. However, the factory system usually subdivided former trades into multiple processes, which became known as specialized taskings. The process was very successful. It out-produced the craftsmen and the small independent shops, and made them largely obsolete.

So who is the customer? The definition has not changed since the 19th century: a customer is the immediate individual you pass your product and service to. The craftsman or small shop owner dealt directly with the customer. Because they handed their products or services directly to the customer, there was not a hierarchy or any sub-process owners to work through. The process is still true today; however, most organizations miss the mark when it comes to the process of identifying the customer. Most organizations want to go global and only identify the customers external to the organization, which is the last individual in a long chain of customers. The illustration below represents a graphical representation of the customer chain.

The customer process starts with the Natural Working Group, those homogeneous groups of individuals working on their part of the process, which eventually move towards a collective of other end items which are delivered to the external customer. The Natural Working Groups are the process owners of the product or service which is delivered and their immediate customer is the individual they pass their product and services to.

The above model represents three sets of groups: supplier, natural working groups, and customers. The model does not limit us to only one of the three functions. It shows that the process of customer satisfaction must have all three functions participating in an open communication forum for the process to work, namely meeting a customer's expectations.



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In one view of a process you would be a natural working group for a customer, in one direction of the model, however you are the customer for the other direction of the model. For example the natural working group is the supplier of the next individual in the process, who is the customer. However, that same natural working group is also the customer for the supplier who is providing the material to you to accomplish your taskings.

Organizations need to work the process of customer satisfaction from the natural working group level, by building customer satisfaction from a bottom up approach. Measure the level of customer satisfaction at each step, instead of waiting to measure customer satisfaction after the end product or service is provided to the external customer of the organization.

## **Element One For Success: Employee Participation**

The industrial revolution of the late 19th century broke sharply with European tradition of management with the adaptation of Frederick W. Taylor's system of scientific management concepts. Taylor's goal was to increase production and productivity without increasing the labor cost. His concept was to separate the decision making process from management. In those days the decision making process of the factory work was done largely by factory supervisors. In Taylor's view, management lacked the technological literacy of the processes to make decisions. Taylor's solution was to assign the decision making process to both management and workers. He maintained that, if you wanted to find out how to increase production and productivity, management needed to embrace the concepts of employee participation.

Taylor's concepts were so innovative and controversial that he was asked to speak to Congress about his new management philosophy of employee participation, empowerment, and involvement, as well as his thoughts on employee compensation and recognition. Taylor was a strong believer in the principle that if you are going to ask employees to participate, then let them; don't just make a facade for upper management and do business as usual. He believed the best way to determine an organization's success in implementing the new management approach was the success of the organization's formal suggestion and award programs. In corporate America today many organizations' suggestion programs are nothing more than a paper document, with less than 10% of the work force participating in the process. The same is true about award programs. Less than 15% of the work force receives any type of recognition for the work they accomplish. Taylor's question concerning that issue in 1911 - and it is still true today - is what are you doing for the other 85% of the work force to keep them motivated.

Henry Ford was the first to start using the concepts of Taylor; he even titled the approach as Taylorism. However, Mr. Ford did not implement the approach correctly. He accepted the concepts of scientific management, at least the part of the concept that let management establish time frames in which steps in the process should be accomplished. Ford liked the idea that he could identify workers who were less likely to perform at the level that was acceptable by management. Ford later identified this as Theory "X" and Theory "Y" employees. The following chart illustrates the concepts of Ford, which he linked to Taylorism.

Ford's identification of Taylorism was not what Taylor identified as the new management approach for corporate America which he shared with Congress in 1911. Ford implemented a process that



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worked directly against the first element of a successful organization and his process failed. The element itself was not a failure, it was the implementor of the process that failed. Taylor was the first to focus on the concept that 85% of the problems in the work force are linked to management and only 15% have any causal link to the work force. That message is still true today, although many of our organizations have tried to implement programs using just the titles correctly and not the concepts. Consequently, the programs failed and the leadership of those organizations are quick to state that the programs are a failure.

If an organization is going to be successful it needs to embrace the true concepts of Taylorism;

- If you want to know how to increase productivity and production then ask the work force who is working the particular process
- Let the work force participate as a full partner in the decision making process
- If the work force came up with the ideas then reinforce and reward them for the success, don't just reward management
- Establish and implement a formal suggestion program
- Establish and implement a formal awards program that recognizes everyone's level of contribution to the success of the organization, not just the high achiever's

## **Element Two For Success: What Gets Measured Gets Done**

By 1924 corporate America witnessed the first significant wave of the so-called "Statistical Process Control" approach, which we recognize as the "Metric" process today. It had its origins in the Bell System of Quality Control. In 1926 a team from the Bell Telephone Laboratories proposed that the Hawthorne Works of Western Electric Co, the manufacturing arm of the Bell System, applied a certain new statistical methodology to measure the level of quality. The new tools consisted of:

- Walter Shewhart's newly developed theories on Control Charting and PDCA
- Probability theory of sampling inspection versus 100% inspection
- A case study using two study groups relative to a demerit plan for one of the study groups

Walter Shewhart was the Quality Director for the Hawthorne plant and was much very interested in the concept of reducing variation in the manufacturing process of phones, thus increasing the overall level of productivity and production. As a result of his studies with standard deviation he developed a set of formulas to help establish an Upper Control Limit and Lower Control Limit for any given process. The following chart below illustrates Shewhart's control chart:

UCL = Upper Control Limit

X = Called "X Bar" Process Average-Mean

LCL = Lower Control Limit

Each of the teams studied was measured against the Control Chart Process. A team's productivity was measured and compared with that of another team. As lighting was increased for one team it

was decreased for the other. Surprisingly the productivity of both groups went up. Even when the lighting was subsequently reduced the productivity of both teams continued to increase. It was not until the lighting had become almost as dim as moonlight did the productivity started to decline. The results of the case study failed, at least in the eyes of the University of Chicago researchers who conducted the study. The professors predicted that the team deprived of lighting would have lost their incentive to maintain their level of productivity as soon as the light was taken away. When the team was asked why they kept up with their productivity, their response was that they were being looked at. The success of the Hawthorne study is not control charting, or sampling, or even the merit system, but the concept that what is measured gets done.

Therefore, if a program is ever to succeed, management needs to take an active role in identifying the important aspects of the program and measure its implementation. Each of the active participants in the program will have to be informed of the level of expectations from management. Each level within the organization needs that level of information, “Cascaded” throughout the organization. Without that active role the programs are doomed to failure, because whatever is identified by management as important will be acted upon, and if management does not embrace the new program, the new program will be left out there on the vine to die.

The second great success of the Hawthorne Studies was the concept of process modeling. We hear a lot about processes having a systematic approach, the idea that what we are doing should have a complete cycle of review focused on continuous improvement. Shewhart introduced that concept to the process of manufacturing phones for the Bell System. His model was called PDCA, or Plan, Do, Check, Act. It was a very simple approach, but was the foundation of the Modeling Process (Systematic Approach) in use today.

The Planning approach of the model represents the Plan, the method, or the approaches organizations use to accomplish a given task. Do is the actual implementation of the Plan, focusing not only on the actual doing, but on the methodology of cascading the Plan throughout the organization for full implementation. Check is the evaluation of the Plan against its objectives or outcomes. If the Plan fell short of that outcome or objective then the Plan is acted upon for improvement and a new improvement Plan is implemented. That idea of doing a PDCA approach to doing tasks seems simple enough, but just like the first element of a successful organization, corporate America is still having problems implementing this concept.

Much of the scoring process in the Baldrige criteria is linked to the PDCA cycle. If we break down the Approach and Deployment criteria for scoring into five segments, segments 2, 3, and 4 are all linked to the PDCA system. As an example for an organization to receive a score of 10% they need to at least have a Plan. To receive a 20% the organization needs to show they have implemented the Plan, that it is proactive, and that it is improving the organization. To score a 30% the organization needs to at least show that 20% - 30% of the organization has implemented the Plan. To achieve a score of 40% the organization needs to show that they have completed a full PDCA cycle for the Plan they have identified at the 10% level. The five segments are identified in the diagram below.

Percentage	Segment	Approach and Deployment
0%	1	No systematic approach evident - No Plan, Method, or Approach

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10%	2	Beginnings of a Systematic Approach - A Plan has been developed
20%	·	Evidence that the Plan(s) is transiting from Reactive to Proactive · The Plan is implemented · Early stages of quality improvement
30%		Implementation of the Plan(s) to 20% - 30% of the organization
40%	3	Sound Systematic Approach · At least one cycle of PDCA for the Plan(s) identified at 10%
50%		Fact based improvement process · Evidence that the organization has a model for evaluating processes and is using that evaluating approach · Evidence that the organization uses data, metrics, or statistics to make decisions · Fact based improvements are linked to the organization's Plan(s) identified at 10%
60%		No major gaps in the implementation of the organization's Plan(s) · Implementation of the Plan(s) to 40%-50% of the organization
70%	4	Sound Systematic Approach · At least 2 or 3 cycles of PDCA for the Plan(s) identified at 40%
80%		Fact based improvement process · Evidence that the organization has a model(s) for evaluating processes and is using that evaluating approach · Evidence that the organization uses data, metrics, or statistics to make decisions · Fact based improvements are linked to the organization's Plan(s) identified at 40%
90%		Approaches are well deployed - implemented to 60% - 70% of the organization
100%	5	· Sound systematic approach - fully responsive to all items and areas to address · Very strong fact based improvement process - continuous improvement of all key processes · Approach is fully implemented - with no major gaps at all levels of the organization to 80% to 90% of the organization.

During the 1920s and 1930s, much of corporate America did not have any involvement in the Bell System's approaches to the two elements that make organizations successful. In fact, the only other organization involved with the concepts was a Joint Committee on Inspection and Statistics and Economy, which was a government and private industry endeavor similar to the American Society for Quality Control. However, there was hardly an impact on corporate America's concepts of management as a whole and much of the country's management style was that of Ford's X-Y Theory. The new concepts had to wait until World War II. During the war the approaches of Bell and the committee became the basis of several statistical courses and of various publications relating to the process of training managers to embrace employee participation in the decision making process.

U.S. involvement in World War II began as a supplier to the Allies during the late 1930s. The Japanese attack on Pearl Harbor in December, 1941, then brought the United States into the war as a combatant. Legislation was enacted to put the country on a war footing. A War Production Board was created to gear the civilian economy to the war machine and to produce enormous quantities of military products. Much of the new sophisticated technologies were that of Shewhart's Modeling Process of PDCA and his Control Charting techniques for reducing variations in processes. It was extremely critical that the manufacturing of military products met the same manufacturing specification, regardless where the products were being built. That is if a jeep was built in a plant in California another jeep manufactured in New Jersey and were both broken on the field of battle, the parts would be interchangeable to make one serviceable jeep. Prior to

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this point in time this was unheard of in manufacturing. Consequently, regulations were established to give the war effort priority in allocation of training in these new skills of manufacturing using the new sophisticated technologies of Shewhart's PDCA and Control Charting, and Taylor's management style of employee participation in decision making.

The process was extremely successful because of two factors; first was the U.S. government's involvement as a partner with corporate America and, second, the rapid change in the work force during the war years. Of the two factors it was the second which led to the institutionalization of the new philosophy of manufacturing that embraced the Shewhart and Taylor approaches. There was a great human demand for the war effort and the women of the time filled the massive void left when the men went off to war. Since they did not have any attachments to the old paradigm of manufacturing they freely accepted the new approaches. As a result of that acceptance the third element that makes an organization successful emerged. That element is currently called Policy Deployment.

### **Element Three For Success: Policy Deployment - Cascade Approach**

For the new approaches to work during World War II every element of the manufacturing arm of the nation needed to work together, focused on a given direction. The young man that helped that event take place was Dr. Homer Sarasohn. During WW II Dr. Sarasohn worked for the War Department and was instrumental in developing a methodology focused on Policy Deployment. At the close of the war, in 1948, Dr. Sarasohn was asked to come to Japan by Gen. Douglas MacArthur, to work with the leading scientists and engineers, to help rebuild the manufacturing industries of Japan.

The small group of 52 men that Dr. Sarasohn started to work with became known as the Japanese Union of Scientist and Engineers (JUSE). They are still a very strong force in Japan today and they are the equivalent of our American Society of Quality Control (ASQC). Their mission statement, that Dr. Sarasohn helped develop, was to become the leading economic power in the world. JUSE's first objective was to have Dr. Sarasohn instruct them on the new methodologies used during World War II: Shewhart, Taylor, and the philosophies of Policy Deployment. The Japanese believed that one of the main reasons the U.S. won the war was because of the Shewhart models and Taylorism. There must of have been some truth to that belief, because when Sarasohn asked for permission to teach the Japanese about the Shewhart model, the Defense Department classified the model a national security issue and did not authorize its release.

So for the next two years Sarasohn worked with JUSE to help institutionalize the concepts of Policy Deployment. We know the process today as the Cascade Effect. The analogy that best represents a descriptive analysis is that of a water fall. If you have ever been to Niagara Falls and seen the water cascade down from one to the next level, it is no wonder why it is identified as one of the seven wonders of the world. The best view of the falls is from Canada, where the distance from one side to the other is less than half a mile. The deepest part of the water, just before it is cascaded downward, is less than five feet at its deepest point. So if an individual were six feet tall he should be able to walk from one side to the other, viewing the water cascading downward along side of them. Of course no one would try, because the force of the water is so powerful at that point and the person would be overcome by that force and pushed over to the next level. We can

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say the same for the cascade effect of the nation's direction during WW II. Everyone was focused on the chosen direction and force of that commitment was like that of a water fall.

However, that is just one third of the process associated with the cascade effect. We also need to look at the movement of the water before it gets to the water fall, those small little creeks and rivers feeding the process. The water at that point in the process is barely moving and the pace of the water not even noticeable. That is how the organization's new direction is developed: the organization must start out slow to go fast. The speed comes with the commitment from a critical mass at that level before the force is great enough to be successfully cascaded down to the next level.

Our final third of the process is focused on the turbulence at the bottom of the water fall. The most powerful boats on the water today are the ones that carry the tourists to the base of Niagara Falls. If they get trapped in the turbulence of the falls it takes two other boats to pull them out, since they do not have the power to pull themselves out. The same is true about cascading a chosen direction of an organization: just because we have commitment from the top does not guarantee success. There needs to be more than one voice from the level above the cascade effect, supporting and mentoring the process. It requires true commitment, a strong focus, and real effort of walking the talk.

So often organizations forget the other two thirds of the cascade effect and focus only on the cascading of the information. Information without action is nothing more than a false start on a short road to failure of the chosen direction. Florida Power and Light found this out when they went on their journey to win the Deming Quality Award. They developed a partnership with a fellow power and light company based in Japan. After the first five years of the partnership the Japanese Company won the Deming Award and Florida Power was still at the same place they were five years ago. Management discovered that they had talked the talk, but they had not walked the talk. They had sent out countless correspondences, spoken of the efforts at every gathering, spent thousand of dollars on training and received no result. What they were missing was the real cascading of the chosen direction.

So for two years, from 1948 to 1950, Dr. Sarasohn focused most of his efforts in institutionalizing the process of Policy Deployment for the Japanese Union of Scientist and Engineers. It was not until 1950 did Sarasohn get permission to instruct the Shewhart models. So in 1950, Dr. Sarasohn contacted Dr. Shewhart to see if he was available to come to Japan and give a lecture on his models. His response was negative because he was in the hospital and would not be able to travel for sometime. However, Shewhart did give him another point of contact to lecture on the content of his models. The individual he identified was a young man who had worked for him as an inspector at the Hawthorne Plant, by the name of Joseph Juran. However, Juran was working for the Defense Department, writing a quality manual for the military about Statistical Process Control. So when Sarasohn contacted Juran he stated he was not available at that time. He heard; however, about a gentleman named Edward Deming who was working for the Department Of Defense on statistical methods. So Sarasohn contacted Deming and the rest of the story is history.

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## Same Old Story - Just A New Title

So from 1911, the early years of our industrial revolution, to 1950 when we formulated our last element of a successful organization, all of the elements that make a successful organization were established. The title of these three elements was called by Dr. Armand Fiegenbaum in his doctoral thesis “Total Quality Control.” Dr. Fiegenbaum went on to publish his book in 1951 and it is now in its 40th edition. In 1954 Peter Drucker put his spin on the concepts by introducing Management By Objectives, which is based primarily on two elements. Drucker liked the measurement side of the process and linking it to employees, with a strong focus on employee participation. However, what Drucker was lacking was the “Cascade Effect” along with some of the fundamental concepts of “Employee Participation in the Decision Making,” and “What Gets Measured Gets Done.” By 1951 Dr. Deming was lecturing full-time in Japan and he established his published 14 Points for a Quality organization, which are fundamentally grounded in the Three Elements of a Successful Organization. By 1954 Dr. Juran was now lecturing in Japan about Statistical Process Control, relative to the book he had just published in 1953. It was not until the late 1970’s, after the Japanese awakening that anything else really started to happen. Corporate America was awakened by new terms called “Zero Defect”, “Quality Circles”, “MBO”, and finally “TQM or Total Quality Management.”

Total Quality Management is not a new invention. It is the essence of a successful organization. We have to keep coming up with new titles for these three elements, because we keep implementing them incorrectly. We in corporate America only choose the parts of the three elements that we are comfortable with implementing and discard the other parts. The reason for that occurrence is linked to what is identified as the Thaw Freeze Model:

The Thaw Freeze Model came from the teachings of Dr. David Kolb from his Experiential Learning theory concerning adult learning. By unconscious incompetence, he means that we are not aware of what we do not know. However, as we learn about our incompetence the model reflects in the second level of learning, that we become aware of what we do not know. Then, as we apply the new concepts, our awareness moves us towards a more competent state. As we move toward the third level of learning, we are competent in what we do but we have to think about the process of doing it. The final stage of learning is the unconscious competent level in which we do not have to think at all about the process in order to do it. At this level the thinking and doing are congruent.

From 1948 to the present time, corporate America has worked towards becoming congruent with the three elements of a successful organization. There have been several organizations, such as Xerox, Motorola, Federal Express, Eastman Chemical, just to name a few, who have institutionalized those concepts. There have been times when governments (U.S. and U.K.) have gotten involved with the process. In the 1950’s the U.S. published a Military Standard 9858, which identified 20 items governing the quality movement for 30 years relative to manufacturing. Then in 1987, both the U.S. and U.K embraced quality again, each taking what seemed to be a different approach. The U.S. approach was the Baldrige Criteria, while the U.K. used the ISO 9000. The ISO 9000 criteria was based on the Mil-Std-9858 approaches of 1955 and the Baldrige on the Shewhart approaches of 1924. What is very interesting is that each of the two approaches is still grounded in the three elements of a successful organization, only with different titles.



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So when we hear that TQM is a fad, the title TQM itself may be, but the concepts are well grounded and are part of every organization that has been successful from the start of the industrial revolution. The question that remains unclear is how successful will the three elements be in our current revolution from the industrial to the informational age. Since the resources to market the information age are still high tech and human resource intensive you can be assured that the three elements will play a big part in who rises to the top by the year 2010 and beyond.





### **Senior Master Sgt. Terry E. Young**

SMSgt. Terry E. Young is assigned to the 108th Air Refueling Wing Air Mobility Command (AMC) New Jersey Air National Guard as the senior quality advisor to the wing commander. He has a Baccalaureate Degree in Business Management from Richard Stockton College, New Jersey. Sergeant Young concurrently serves as the Satellite NCO Academy Distance Learning Administrator for the 108ARW a post which he has held for two years. Prior to becoming a full-time Air National Guard Technician he was CEO of a New Jersey Based Corporation with a Photographic and Video Service Center concern. Sergeant Young has been in the military either on active duty or as an Air National Guard member for over 30 years.

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# Satellite NCO Academy - A Sites' Perspective

## Fulfilling PME Requirements Using the Warrior Satellite Network

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### Abstract

The United States Armed Forces have been drawing down at an accelerated rate since the end of the cold war resulting in fewer people expected to perform at the same operational level as before. The Air National Guard (ANG) vision statement characterizes the US Armed Forces: "...a nation that slowly returns to the militia concept in a more peaceful but still dangerous world." Volunteerism and managing a volunteer force becomes paramount. Educating the volunteer force is the first major challenge.

Today the reserve forces — Air Force Reserve (AFRES) and ANG — are balancing operational missions and required training and education with family and civilian employment. This balancing act is straining the membership of a volunteer military force. The primary question is "How do we fit it *all* in?"

To fit *some* of it in the National Guard (NG) developed the Warrior Satellite Network. A satellite television system used for Guard-wide communications, that can instantly broadcast to all NG bases. Presently the TV system is used to broadcast the Non-Commissioned Officer (NCO) Academy curriculum to the 27 participating ANG sites across the country, in four time zones, fulfilling the Professional Military Education (PME) requirements for junior NCOs. This paper will illustrate the home-station Satellite NCO Academy experience as it pertains to one specific site - New Jersey. The paper will discuss the history, beginnings, implementation, and momentum required to be successful in "*shaping tomorrow's Air Force*" using modern technology.

### Introduction

The AFRES and the ANG, as part of the "Total Force," find themselves "on the road" almost as many days per year as their active duty counterparts with 45 percent of missions being operational and off-station. This increase in "Operations Tempo" is a far cry from the days of the "Flying Clubs." the fraternities where military aviation began and where much of the flying was done at individual expense. Today, reservists attend one weekend per month and approximately two weeks per year of annual training and are truly a professional fighting force. However, the reserve force must maintain its professionalism. Performing just the mission is not enough. The weekend per month coupled with two weeks annual training is being stretched to the limit. Some of that precious time must be spent in formal PME schools. The question of how a reservist, specifically a junior NCO, can complete the required PME, compete in career progression, and keep his or her family as well as the civilian employer happy while fulfilling the mission of the Air Force must be answered.

To meet a part of this need the ANG implemented its Satellite NCO Academy Program. This program allows traditional drilling guardmembers who are unable to get away for extended

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periods of time to fulfill the requirement of NCO Academy in residence. This is a brief account of how the Satellite NCO Academy Program began, how the 108Air Refueling Wing implemented the program and how we are maintaining momentum as the program begins its fourth year.

## **History**

Fulfilling the PME requirements for ANG NCOs became a challenge in the late 1960s and early 1970s. The Air National Guard NCO Academy began in the early 1970's using a great deal of flexibility teaching the NCO Academy curriculum. Until five years ago an NCO Academy student could either complete the course in the traditional 6-week format or in two phases over a time period of two years. In 1992, the Air Force standardized the NCO Academy curriculum making the ANG phase program obsolete in 1993.

Now students attending any NCO Academy, whether at McGhee Tyson, or any other Air Force school, receive the exact same lessons and are evaluated in the same manner. The standardized course is also used by the Satellite NCO Academy. The Community College of the Air Force (CCAF) awards NCO Academy graduates 9 college credit hours. All curricula are developed by the College for Enlisted Professional Military Education (CEPME) at Air University. CEPME gives each PMEC authorization to operate as an NCO Academy, certifies the instructors and certifies the course material.

Most traditional drilling junior NCOs find it increasingly difficult to attend an NCO Academy in residence due to the possibility of job loss. The Satellite NCO Academy Program was implemented to allow more Traditional Guardsmembers the opportunity to complete the NCO Academy by combining home-station and in-residence phases. When Satellite NCO Academy began offering its Distance Learning program, the 108th stepped up to participate.

## **Implementation**

The 108ARW has participated in the Satellite NCO Academy Program since the initial validation class. It has always been common knowledge that many of our traditional drilling junior NCOs are unable to attend any PME in residence due to the time required beyond the normal two weeks annual training period. The Satellite Program provides the opportunity to help these fine NCOs attend the Academy. In 1995, the 108ARW became a validation site with the experienced help of SMSgt James Ford, who at the time, had just become New Jersey's Recruiting and Retention Manager. Sergeant Ford came from the NCO Academy, McGhee Tyson ANGB, TN, already certified as an Academy Instructor. His dedication and counsel set the stage for a successful validation semester. Since that early success we have graduated thirty students and will graduate our third class of 14 students in June this year. A note for fiscal year-1998. The Satellite NCOA will begin in the October - November time frame for Eastern Time Zone sites, three months ahead of the traditional starting date of January to allow for program growth to 49 sites across 5 time zones.

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## The Staff

Let us look at the essential prerequisites for the on-site staff by first taking a look at the facilitators. The site should have at least five active facilitators due to the diverse nature of the NCO Academy curriculum. Without facilitators the Satellite NCO Academy Program cannot function since the on site facilitators guide the students to higher levels of learning and work with students on scenarios, group projects and performance exercises. The Commandant and the NCO Academy faculty of certified instructors are at McGhee Tyson, ANGB, TN. The 108ARW Satellite Program staff serve as part of their cadre.

Facilitators must be graduates of an in-resident NCO Academy or Senior NCO Academy, hold at least an Associate's Degree, conform to military standards, and be willing to commit themselves to a minimum of two years in the program; (possibly uncompensated). In addition, the facilitators must present themselves in a consummate military manner and be highly motivated to help their students achieve success.

The site staff also includes an Administrator and assistant. The selection of an administrator follows the same guidelines as the facilitators. We have found that the Site Administrator should be senior to the facilitators and be willing to spend even longer hours ensuring the success of the program. Finally, we found a need to have a small administrative staff due to the amount of paper flowing between the site and the Academy. Once a staff is in place a suitably equipped classroom is necessary.

## Facilities, Equipment, and Technology

**The Facilities** - The classroom is an important aspect of the Satellite NCO Academy experience. The 108<sup>th</sup>'s facility has a pleasant second story view with plenty of storage. This facility is semi-dedicated to the NCO Academy site and is owned by the administrator.

**The Equipment** - The classroom is equipped with state of the art electronic devices including. A television (TV), video cassette recorder (VCR), video camera recorder, computer, TV to computer interface, overhead projector, and other Audio Visual aids conducive to academic presentations and instruction are used.

**The Technology** - The live TV broadcast originates from the PMEC at McGhee Tyson ANGB, TN, Studio with ANG NCO Academy instructors via the Warrior Network. On-camera instructors teach each lesson block. The broadcast communicates through one-way video and audio equipment. The two way audio link is completed through a telephone connection using a Teleconferencing Telephone Interface (TTI). This communication system is also used to provide In-Service Training (IST) workshops for the remote site NCO Academy staff. The IST workshops alone have saved many dollars in travel, active duty days, and per diem. There is one additional advancement that is the keystone of operating a Satellite NCO Academy site; the internet "e-mail". The "e-mail" system has increased our sites ability to conduct business with the Academy ten-fold, allowing up-to-the-minute changes to the schedule, graphics to supplement lessons, test scores and other general information to be received at the unit on a real time basis.

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## The Students

Unlike active duty personnel who are available virtually any time for training and education, ANG students are not. The Satellite Program was designed primarily for the traditional drilling guard member. The class meets two evenings per week for five and a half months. Students at the 108<sup>th</sup> are selected by considering eligibility for promotion and by status —traditional drilling, Air Technician (full time employee in civil service status), or Active Duty Reservist (AGR). All traditional guardsmen have priority.

It is difficult to talk about students unless the benefits are mentioned; specifically, the results. Test scores are important, but of even greater benefit is the gained knowledge from the course curriculum, and the increased networking among the students not only within the wing but outside the wing. The knowledge gained from the course of study increases the awareness and comprehension of world issues and as improves communication skills to and better prepare our junior NCOs to carry out today's Air Force mission as it evolves in our ever-changing world. Students in the Satellite NCO Academy perform as well on objective tests and writing and speaking exercises as students in the traditional 6-week NCO Academy format.

In the nineties jargon the word "Networking" becomes key. Because of the total force concept, the 108th's Satellite Program is open to the USAF and AFRES as well as the four ANG units in our state. Although this year's class is comprised of only ANG students, previous years have included active duty NCOs. During the two weeks in residence, networking continues as students from the other Satellite NCO Academy Seminar sites come together at McGhee Tyson, ANGB. These relationships last throughout an NCOs entire career, a side effect that has enhanced not only internal cooperation but inter-unit collaboration within the state and across the guard, aiding mission accomplishment.

## Maintaining Momentum

There are a few issues that must be considered when managing a highly spirited, volunteer force, even as the U.S. military moves toward the militia concept. The most eager volunteers must have command support, reward for their effort, and compensation for their added responsibilities.

Command emphasis and commitment is key to the success of, and at the heart of shaping the Air Force of tomorrow for any program. With command emphasis and commitment, junior NCOs will see PME as a valuable achievement and make the commitment to participate as students. Supervisors and commanders will make use of the newly graduated NCOs; giving them more responsibility and authority resulting in an empowered work force. NCOs who volunteer as Satellite Program on-site staff will feel appreciated knowing their efforts are valued.

Creativity to reward the students and staff is another issue that must be contemplated. When there is one class per year at each site, the students and staff have a sense of honor being selected for participation in the Satellite NCO Academy program. The 108th publishes several articles in the wing's newsletter "Wing Tips" to document the progress of the class. In addition,

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the on-site staff attends graduation at McGhee Tyson. The Active Guard Reservist (AGR) staff is rewarded with three day passes. Reward and recognition is on-going.

### **Summary**

Today all ANG members are volunteers. However, when we ask our volunteers to go beyond the allotted time of the weekend per month and two weeks annual training per year we must be creative. Volunteers usually volunteer for everything including, but not limited to, highly visible programs as such as the NCO Academy. Facilitators who are involved in the 108th Satellite Program are involved with the Honor Guard, base tours, attending college courses, retirement ceremonies, and the list goes on. It is important the facilitators temper their involvement with reality. There is a real concern over volunteer burnout. One of the first warning signs is emotion replacing professionalism. Local commanders have worked out individual compensation plans to help ward off burnout. The Satellite NCO Academy fits firmly into the burnout equation. There is a real pressure to perform at peak performance while volunteering for every program in which the wing is involved. Therefore compensation must be suitable and forthcoming however it is administered.

The future views Satellite Distance Learning as the normal way of training, the normal way of educating and the normal way of communicating. If you are not a believer, just turn on the TV at home and channel surf. Many channels are learning based programs. In the workplace conversations have shifted from commercial situation comedy or melodrama to the latest watched program on one of the educational networks.

Our work force is becoming smaller as training continues to move toward de-centralization. We, the USAF, AFRES and the ANG must better prepare to use today's technology, to educate our work force, help our fellow airmen perform today's ever evolving mission and in turn help to *Shape Tomorrow's Air Force*.

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